

THE PRESIDENT'S PAGE

An Appeal to Legislative Reason:

Highways are not government subsidized; users paid more than the \$13,000,000,000 bill since 1931 in taxes.

Railroads pay a 1.4 per cent tax on a valuation of \$25,000,000,000.

Highway transportation pays a 4.5 per cent tax on a valuation of \$22,000,000,000, or 3.15 times more.

Excessive taxation is beginning to affect the yield from motor vehicle revenues.

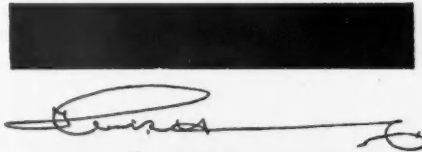
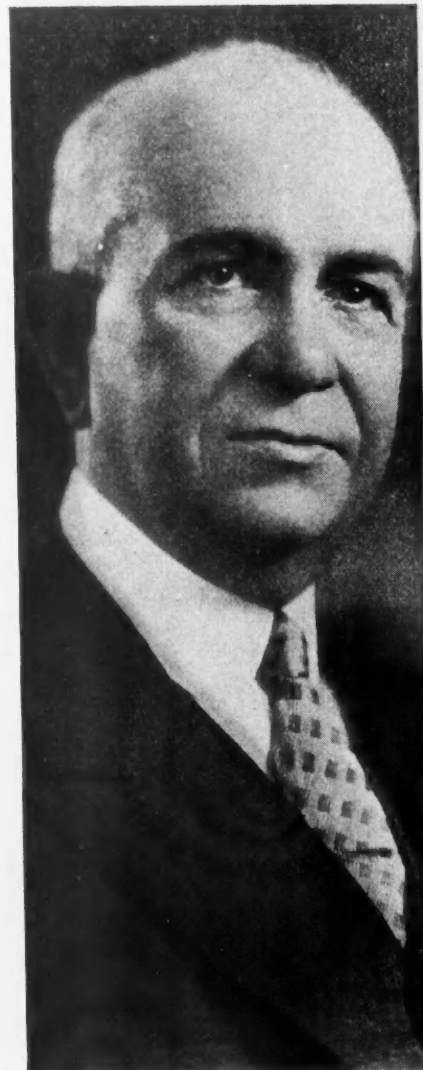
50,000 communities in the United States have no rail facilities and are wholly dependent on highway transport.

NO one can quarrel with the railroads for asking equality of treatment. But when the railroads unwisely seek to destroy highway transport through excessive taxation, all highway users must meet a common danger. The railroads are confusing the issue of wholesome regulation, and, while on the surface they are directing their campaign against commercial motor vehicles, their propaganda about road subsidies directly encourages new tax inroads on the 22,000,000 passenger car owners who pay the major portion of the highway bill of the country.

In a statement issued July 20, 1932, R. H. Aishton, Chairman of the Executive Committee of the American Association of Railway Executives, asserted that the Federal and state governments had since 1921 subsidized motor vehicle users to the extent of more than \$13,000,000,000. This statement is highly misleading, since it leaves the impression that these funds were provided from general taxes. Now, what are the facts?

In the period 1921-1931, motor vehicle owners paid \$7,600,000,000 in special taxes to state and local governments. These taxes were simply motor tolls specially earmarked for highway maintenance and construction. Add to this \$1,000,000,000 in road bonds issued by the states as a definite charge on the highway users, since they are to be retired from motor vehicle revenues, and it will be seen that motor owners directly shouldered \$9,000,000,000 out of the \$12,000,000,000 road expenditures by the states and counties in that period. The fact of the matter is that the highway users have provided the capital for a permanent investment of billions of dollars for state and local highways.

Now, let us look at the so-called Federal Aid subsidy. At the moment, Federal Aid is on a basis of \$125,000,000 a year, but special motor taxes are on a basis of \$258,000,000 a year. Thus, the highway users are paying the United States Government at the rate of two dollars in Federal taxes

By

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for one dollar in Federal Aid. It can, therefore, be fairly contended that the motorists as a class are now subsidizing the Federal government and caring for the great road interest of the latter in our national highways.

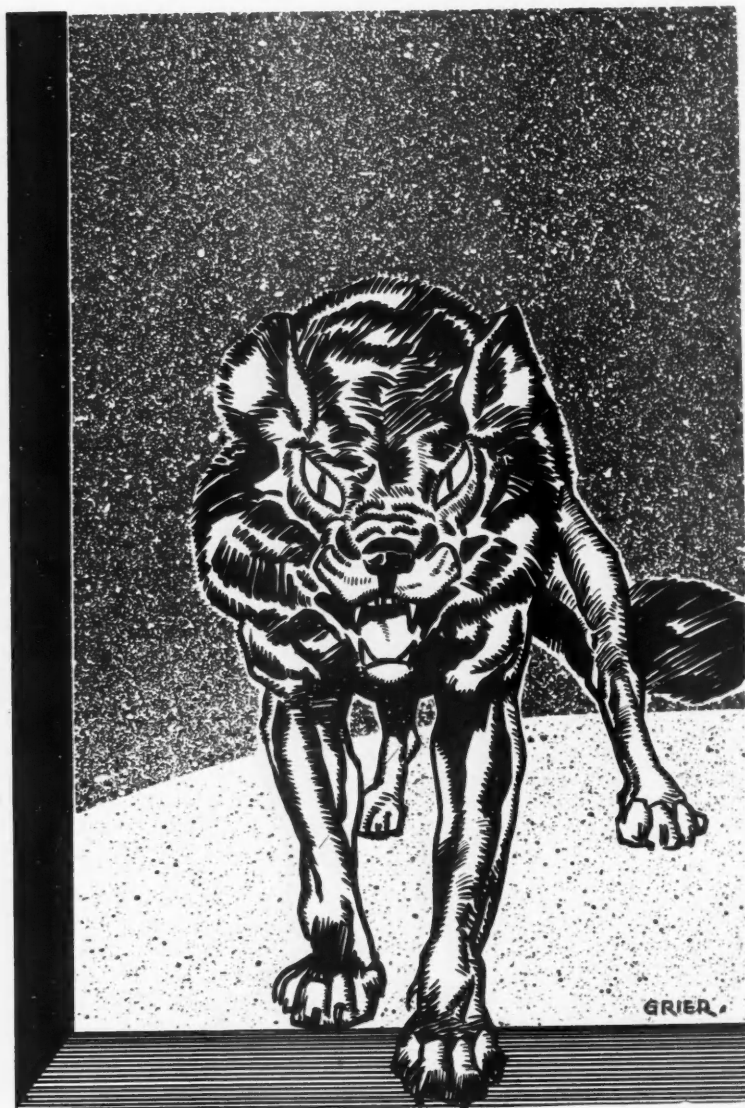
The railroads claim a valuation of \$25,000,000,000. On this valuation they paid \$354,000,000 in taxes of all kinds in 1930. This was a tax of 1.4 per cent per annum of the valuation. In the same year, motor vehicle property had a valuation of \$5,500,000,000. On this, the motor vehicle owners paid \$1,000,000,000 in special taxes, that is, gasoline taxes, registration fees, license fees, et cetera. This amounted to 18 per cent of the valuation or an annual tax 13 times as heavy as that paid by the railroads.

It will be objected, of course, that the motor vehicle tax is partly a privilege tax for the use of rights-of-way owned by the states, while the railroads own the capital in their own rights-of-way. Let us, for the moment, concede this—although the highway rights-of-way were paid for in large part by the users—and interpret the motor tax in terms of the total investment in highway transportation, namely, highways, rolling stock, garages and terminals. This is estimated at \$22,000,000,000. On the basis of this estimate, motor vehicle owners are paying 4.5 per cent on the valuation of highway transport, or 3.15 times the tax paid by the railroads.

While the railroads are seeking to create the impression that highway users are not paying their way, the fact of the matter is that there is nothing in the history of American taxation that compares even remotely with the pyramiding of taxes on the motor vehicles. At the present rate of motor taxation, Federal, state and local, the average motor vehicle is paying 175 per cent of its average value in taxes during its life period of seven years. This tax is already beginning to affect not only the use

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THE LEGISLATIVE WOLF IS AN OBSTACLE TO TRUCK PROGRESS



WHAT is legislation and the threat of additional legislation costing truck manufacturers? What is it costing the dealer and servicing agencies of the transport industry in lost business?

Truck manufacturers wonder why equipment that must be worn out long since is not being replaced. They wonder why their dealers are not getting the sales. They wonder why their own branches can't seem to deal in anything but flocks of "repossessions."

The answer is simple and will be found in the present apparent inability of the industry to shake itself of the spectre of confiscated investments and businesses and the lengthening shadows that cloud the future,

because of the constant threat of adverse legislation in almost every state of the Union.

Just this week in talking to one of the leading West Coast truck distributors, one of the outstanding successes in the business, the full significance of the present legislative battle between highway and rail transport disclosed itself in a new light. He said: "We can not longer sell a truck on the basis of its apparent earning capacity."

Truck salesmen have been schooled for years in job analysis and fitting equipment to the customer's requirements on the basis of the earning capacity of the equipment. This has always been the logical approach. It

And to Beat It Off Cooperation of Every Manufacturer and Employee in Truck and Allied Fields is Necessary

By RALPH J. STAEHLI

Secretary, Allied Truck Owners, Inc.,
of Oregon

has justified more sales than any other approach and most logically.

With that gone as a sales foundation how far is the truck market curbed? What is the prospect for dealer and manufacturer when the basic justification for truck investment can no longer stand as the underlying motive for the purchase and the sale of a truck?

Yet, this is actually happening and will continue to happen until the industry in all its branches from manufacture to operation makes up its mind that the uncertainty of the future regarding weights, lengths, trailers, hours of drivers, permits and taxes and the host of other ideas that fill the papers are quieted or disposed of or until the man on the road who faces the gun of competitive legislation knows that back of him is an allied industry.

If this condition which is stifling markets were true of but a limited part of the truck field, it would not be serious. It is easy to assume that only this or that limited group is affected. The fact is that all truck usage is under the gun and that the private owner is as much affected in his decisions as is the for-hire carrier. For proof you have only to scan the following list of items which are the subjects of legislative discussions in practically every state in the Union:

Restriction of trailers; weight restrictions; length restrictions; narrower widths; braking systems; hours of employment for drivers; permits and franchise requirements; operating restrictions; limitations as to classes of service; open and closed roads to certain kinds of traffic; higher license taxes; mileage or gross revenue tax changes; commodity restrictions; railroad competition on the highways.

And yet, one manufacturer wrote me

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FARMERS SEE TRUCK BURDENS AS SHACKLE ON AGRICULTURE

Will Oppose All Legislation That Would Deprive Them of Transportation Economies Made Possible by the Truck

By O. M. KILE

Agricultural Economist, Washington, D. C.

"THE farmer is entitled to the best and most efficient, as well as the cheapest, transportation that modern invention and development can bring to him," said Louis J. Taber, Master of the National Grange, in his address before the annual session of that body, at Winston-Salem on Nov. 16, 1932. He continued:

"We cannot favor a program of taxation or regulation that seeks to stabilize at high levels transportation costs. Rather than put unnecessary restriction on truck development, it may be well to relieve the railroads from restrictions and red tape which hinder them from meeting competition."

This is, briefly, the attitude of the farmer on the present very pertinent question of the relationship of motor transportation to rail transportation. As further evidence of this I quote from a recent article by Chester H. Gray, Washington representative of the American Farm Bureau Federation:

"It is my firm belief that the farmer must call a halt on these tendencies (excessive gasoline taxes and unnecessary restrictions) or he will let slip his great opportunity to get cheaper and more convenient transportation for the products of his farm and the supplies he needs on his farm."

"Farmers hold no brief for buses and trucks, but they want newer methods of transportation as they develop to be free from the incumbrances which the older methods are troubled with. If there is opportunity to get cheaper rates from the use of buses and trucks, farmers and others want such cheaper rates."

During the past ten years the modern motor truck has made for itself an indispensable place among the bet-



ter farmers of the United States.

The census of 1930 reported over 900,000 motor trucks on farms, and in the two years since that survey was made, according to sales records, this number has been increased somewhat even in spite of the poor economic conditions prevailing throughout the nation.

While farm leaders realize that they must continue to depend on the railroads for the long hauls and for the transportation of most of their bulky products, and are therefore concerned over the present financial difficulties of the railroads, they are not in the least impressed by the arguments of those who maintain that higher cost factors should be laid on the trucks

in order to "equalize conditions of competition" for the railroads. In fact, they criticize the railroads for keeping general freight rates at approximately 155 per cent of the pre-war level, while farm crop prices are only about 50 per cent of pre-war.

Neither are farm leaders impressed by the alarm spread by the railroads to the effect that motor traffic is "subsidized"—that the taxpayer is paying for the roads. In the first place, the farmer remembers that he has himself been a heavy taxpayer for a good long time. He sees in the cheaper transportation afforded by motor vehicles a chance to get back some dividends on his many years of tax investment. In the second place, the

better informed farmers know that motor vehicle users are paying out of license fees and gasoline taxes the bulk of all the present annual costs of building and maintaining the hard surfaced roads, as well as making contributions toward the construction of the county and local roads. In many states farmers are undertaking to see to it this winter that a larger percentage of these funds are spent on the county and local roads and local taxes thus somewhat relieved.

The railroads' argument that motor vehicle owners should pay something additional as a contribution to government, falls flat in the farmer's mind when he thinks of the terrific property taxes he pays, including property taxes on his automobile, truck, tractor and garage.

Farm leaders will insist that proper restrictions on size, weight and speed be adopted and enforced; they are willing to ease up on some of the restrictions on the railroads that may be limiting their field of usefulness or their ability to economize and give lower rates; but they have every intention of fighting to the limit any legislation tending unnecessarily to restrict the use of motor vehicles or to lay needless burdens of expense upon them.

Farmers have found the truck a real friend and valuable servant in the business of trying to wring a living from the soil. Motor trucks, large and small, are used for many tasks around the farm but their greatest value has been found to be in handling the farm products and getting them to market, elevator, warehouse or port, in the most economical manner and with the least amount of difficulty or delay.

Growers of fruits and vegetables have found that the motor truck puts them in touch with many more markets than were available to them with the horse and wagon or via the freight or express train. Many commercial apple growers, for instance, find that they are often able to truck their fruit direct from the local packing plant to nearby cities and towns, sell it at a moderate price and make greater profits than by sending the entire crop to the larger cities in carload lots.

Trucks Greatest Factor

Transportation costs are, and have always been, one of the greatest factors in marketing farm products and the motor truck tends to simplify as well as cheapen this step in marketing.

When a grower or shipper uses a motor truck to transport his products to the markets he eliminates at least two handlings en route, as compared with shipping by rail or boat. He sees his products loaded onto the carrier which will deliver them to the final destination and he can have complete control over them all the way if he chooses, by accompanying the truck or, better still, by owning and driving his own truck to market.

Fresh vegetables and fruits can be left in the field or orchard much longer than if they are to be shipped by other means of transportation, and yet they will arrive on the market earlier and therefore in much better condition.

Evidence of the usefulness and adaptability of the truck to the farmer's needs is found in the ever-increasing arrivals of produce by motor truck at our city markets. At Philadelphia the fruits and vegetables arriving by motor truck in August and September, 1932, were more than twice as great as those arriving by rail, according to reports of the United States Department of Agriculture. Motor trucks hauled in 38 per cent of all the fruits and vegetables received at this market on which any record could be kept, during the first ten months of 1932. Many truck-loads brought in by farmers which were delivered direct to retailers or consumers were, of course, not included in the reports mentioned. This is at least 20 per cent more than were trucked to the Philadelphia market during the same period of 1931. Motor truck receipts of fruits and vegetables at New York markets increased 28 per cent in 1932 over 1931. Three times as much fresh farm produce arrives at Los Angeles in motor trucks as is received by any other means of transportation.

Increased 500 Per Cent

Surveys of all the important livestock markets during the past few years also show a steady increase in the percentage of livestock of all kinds arriving at the market by motor truck. The total shipments of livestock to all markets throughout the United States by means of motor trucks increased 500 per cent between the years 1920 and 1930. Approximately 3,000,000 tons of livestock were trucked from growers to 16 important markets in the United States during 1931, according to the National Livestock Marketing Association.

Many local shipping associations have purchased trucks and hired drivers to operate them in order to give their farmer members the best possible cooperative marketing service.

The natural desire of the average American for independence of action, as well as speed, is one of the most influential factors governing the use of the motor truck in marketing livestock and other farm products. By truck the farmer can get his products to market at the exact time he chooses and can go in much less time than is necessary when shipping by rail. And, not the least important by any means, he can get his money the same day. He can get to market within a short time after receiving the market quotations by radio or telephone if desired, or this same information may warn him to hold his stock or other products off the market for a time. He can go to market leisurely between

the light of two days if he wishes, thus saving livestock from weight loss and the danger of overheating, and also enjoying the freedom of an uncrowded highway. Such use also makes the truck available for other uses during a part of the daylight hours if desired.

Vast amounts of cotton are hauled by motor truck each year from the cotton belt to Galveston, New Orleans, and other ports along the Gulf and South Atlantic coasts. Cotton seed, too, is being trucked direct to oil mills in ever-increasing tonnage, saving time and money for the cotton planter.

Transporting milk and cream by motor truck is a well established business and some large cities depend almost entirely upon glass-lined tank trucks for their daily supply of milk. Of course these are not "farm" trucks but they are filled with the product of the farmers' work. Many dairy farmers find the motor truck indispensable in getting their cream to the creamery. In some neighborhoods this business is, of course, handled for the farmers by regular trucking companies that operate cream collection routes on regular schedules.

Poultry and eggs are also important cargo transported from producer to consumer all the way by motor trucks.

In many sections of the United States there are now established egg routes and packing plants depending entirely upon the motor truck for their existence and their ability to operate. Trucks owned by these agencies—oftentimes a cooperative organization of farmers—cover the entire section from which it is desired to collect fresh eggs, running on regularly scheduled routes, picking up fresh eggs direct from the farms designated to produce eggs for that particular agency and taking them to the central packing house. After inspection, grading and packing, larger trucks rush these guaranteed fresh eggs to the large consuming centers, providing a high quality product at a reasonable price. Without the motor truck such efficiency could not be approached, particularly in the matter of concentrating large quantities of fresh, good quality eggs at the packing plants.

Big Egg Shipments

Twenty-two per cent of all the eggs reported to the United States Department of Agriculture as received by dealers at Chicago during the first ten months of 1932, arrived by motor truck. Of course many more truck loads of eggs went to local grocers, markets, brokers and others but were not reported to the government agents. Motor truck receipts of eggs at New York increased 33 per cent during the first ten months of 1932, as compared with the same months of 1931.

Large quantities of live poultry also are received by motor truck at all the large markets.

COORDINATION OF TRANSPORT SERVICES AS IT STANDS TODAY

By G. LLOYD WILSON

University of Pennsylvania

THE term "coordination" means the bringing of all types of carriers into an orderly basis of relationship and the combination of the various types of carriers into unified and harmonious action. It means the adoption and adaption of motor carriers into a general system of transportation in which each type of carrier has its place determined by its peculiar efficiency to perform certain types of transportation services. It does not mean the domination of motor transportation by other types of carriers, nor does it imply the stultification of the usefulness of motor transportation or regulatory bodies which would subordinate the motor carriers to a position inferior to other agencies of transportation.

The coordination of motor transportation with other forms of transportation can be effected in several ways.

First, through the direct ownership and operation of motor vehicles by railroads, electric railways, or steamship lines, to supplement, extend or improve the transportation services of these carriers. Second, motor vehicles may be owned and operated by subsidiary companies controlled by parent railroad, electric railways or steamship companies. Third, motor vehicles may be used in coordinated transportation services, the vehicles being owned and operated by motor trucking companies which act as agents for railroad, steamship or electric railway companies. Fourth, and finally, coordinated motor transportation services may be established by joint through-route-and-rate arrangements between motor carriers and railroad, electric railway and steamship carriers.

The form of ownership and control is material, the essential feature of coordination is that the motor vehicle, railroad, electric railway and steamship lines are fitted together as parts of an integrated system

THE ADVANTAGES OF COORDINATION

The advantages of coordination, in the true sense in which the term is used, should accrue to three groups: first, to the rail or other older established carriers; second, to the motor transport carriers, and third, to the public.

Coordination benefits these interests by:

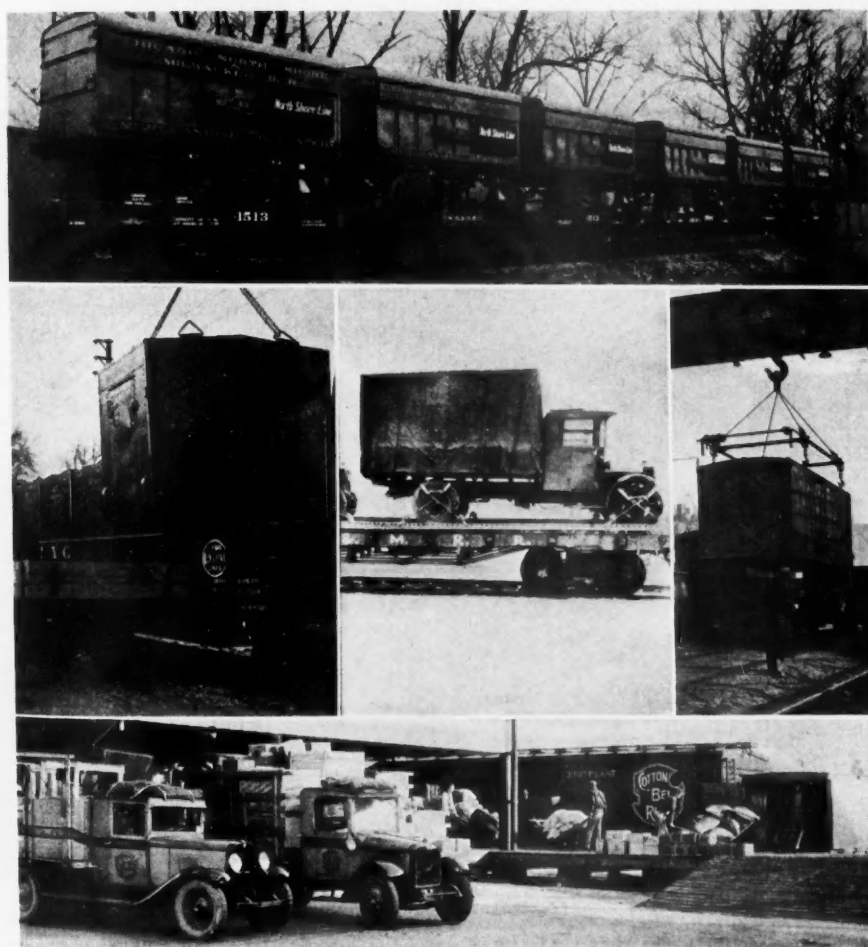
1. Providing a better working relationship among the carriers.
2. Eliminating mutually destructive competition.
3. Enabling each type of carrier to be used for the services in which it is relatively efficient.
4. Improving the door-to-door speed of transportation services.
5. Reducing loss and damage of goods.
6. Reducing the total costs of transportation.
7. Simplifying the arrangements for transportation services.

It is impossible to estimate the exact number of motor carriers or motor vehicles used in all forms of coordinated transportation service, but the number is steadily increasing. The following figures indicate the progress that has been made in the past half dozen years in the use of motor trucks by steam railroads:

Year	Number of Railroads Using Trucks	Number Trucks Operated
1926	20	1600
1927	30	3300
1928	45	4900
1929	55	5900
1930	60	7000
1931	85	10000

These figures do not take in consideration the fleet of between 9000 and 10,000 motor freight vehicles operated by the Railway Express Agency, Inc., a corporation, the capital of which is \$10,000,000.

Five forms of railroad-highway coordination. The top and center views show the ferry truck service of the Chicago North Shore and Milwaukee Railroad. Loaded trailers or trucks are locked on flat cars. The left center view shows a loaded container of the N. Y. Central being transferred to a truck. The Pennsylvania Railroad uses both the container and trailer body service; the latter type is shown at the right. The St. Louis Southwestern Railway Lines (lower view) uses trucks in its Blue Streak service to reduce station stops per run



RESTRICTIVE REGULATION WON'T BENEFIT PUBLIC

By LARUE BROWN

Attorney-at-Law



WHILE the legal technicalities which arise in connection with the various statutes or proposals for legislative regulation of motor carriers are primarily of interest to lawyers concerned as specialists in these problems, certain practical considerations which should be considered in forming opinions as to the advisability of the enactment or modification of such legislation may be worth setting down.

At the outset it should be made clear that we are here talking of regulation in the sense of control by the State of the right to engage in the business of motor carriage and of the details of conducting such a business, with respect to rates, service, accounting, financial responsibility and the like—in short, with the relation of the carrier to his customer. We are not discussing control by the State of the

TRUCKS give all industries service of a precise kind and at the precise time desired at a cost far below that offered by any other transportation service available. Regulation to be effective must be uniform but uniformity will destroy the individual characteristic that makes the truck such a valuable factor in industry.

Regulation should be in the public interest to promote highway transportation facilities and not for the purpose of truck repression to further the interests of other carriers.

The cost to the taxpayer of administering a system of supervision to control the operation of motor vehicles owned by 2,500,000 owners would be tremendous, not to say impracticable.

Burdens which restrictive regulation will impose upon industry, the truckman who operates them and the taxpayer who pays the costs of bureaucracy certainly are placed in the public interest.

physical characteristics or method of operation of the vehicle.

Nor are we here discussing, in any detail, regulation in either sense of motor bus operation. Such operation is of necessity the furnishing of mass transportation and is a service in whose conduct individual necessities or convenience and individual bargaining can have no place. Since the service performed by the motor bus is essentially a regular common carrier service regularly conducted between fixed termini by a relatively small number of operators, it is of a character which lends itself without too serious strain to the control of uniform regulation. There is general agreement that there are certain possibilities of advantage from regulation of an essentially non-flexible type of service which may outweigh the difficulties and expense of effective enforcement of such regulation. With this view, there is no occasion to differ.

Where, however, it is proposed to subject motor truck service to similar control, very different considerations apply. Except as to strictly common carrier regular route service which comprises less than 6 per cent of all truck service, it is plain that the great economic advantage which the motor truck has been able to give to industry has been the provision of individual service of the precise kind

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A PLAGUE OF TAXATION MENACES MOTOR TRUCKS

By STEPHEN D. BRYCE

National Automobile Chamber of Commerce

LEGISLATURES of 44 states will meet in 1933.

Opponents of highway transportation have already prepared measures to strangle motor transportation with excessive taxation.

Their argument that motor transport is subsidized is not tenable in the light of these important facts:

- (1) Special taxes paid by owners of trucks in 1932 exceeded the total tax paid by railroads on their freight and passenger operations.
- (2) Total special taxes paid by all highway users for the same period were approximately four times the aggregate tax credited to rail operations.

Automotive interests must meet the challenge with organized resistance and an informed public.

FINAL figures on motor vehicle taxation in 1932 are not yet available. However, data from the U. S. Treasury Department, the Bureau of Public Roads, the treasury departments of the various states, and other official sources have already established the fact that the total taxes collected by national, state and local governments from motor vehicle owners advanced to a new all-time high of approximately \$1,085,000,000.

Of this amount, it is estimated that motor vehicle taxes collected from owners of the country's fleet of 3,231,000 trucks (representing 13 per cent of the total motor vehicle registration) aggregated \$290,000,000, or, more than 27 per cent of all motor vehicle taxes.

At this point, it should be mentioned that the latest monthly reports of the Interstate Commerce Commission have established the fact that total tax payments by all Class I railroads during 1932 did not greatly exceed \$260,000,000.

On this basis, it becomes evident that in reality the annual tax payments of highway users which Colonel Thom and his associates are so anxious to ignore amounted to four times the taxes of all Class I railroads. Incidentally, these motor vehicle taxes represent almost double the amount which vehicle manufacturers received for their combined 1932 output including 181,000 units which were ab-

sorbed in markets outside of the United States. This astonishing circumstance might well give rise to speculation as to whether the vehicle manufacturers or Government receives the greater share of the highway user's dollar. And, well it might.

Another interesting comparison suggested by these figures reveals that owners of trucks paid in taxes on their vehicles an amount greater by at least

thirty million dollars than the total taxes paid by all railroads! Yet, the total operation of all trucks during the year, assuming that the ratio for the preceding year (the latest year for which adequate figures are available) accounted for a freight, commodity and merchandise movement of less than one-twentieth of the gross revenue ton-mileage moved by the

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Restrictive Regulation Won't Benefit Public

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and at the precise time desired by the shipper at a cost which, considering the factors of time and convenience, is frequently far below that offered him by any other form of transportation service available to him.

Regulation to be effective must necessarily tend to destroy this great service to American industry. Its practical difficulties in a country in which 2,500,000 individual operators each own a single vehicle are in any event so great and complex as to make efficient control almost impossible. These difficulties would be immeasurably increased if any thoroughgoing attempt were made to permit individual treatment by operator and shipper of their individual problems. Regulation which accomplishes anything more than the gathering of information must tend in the direction of uniformity. Uniformity must tend to destroy the great advantage to the shipper which has resulted in his increasing recourse to this agency of modern individual transportation.

The shipping public may well consider this fact. It should also consider another necessary effect of regulation in the form now becoming popular. Texas lately provided:

1. That truckmen may be refused the right to do business under private contract with shippers if in the opinion of a State Commission the effect will be to impair the efficiency of "existing common carrier service"—including railroad service.

2. If a truckman is permitted to do business under private contract he must charge as much as the common carrier does for similar service.

In short, the individual service which many shippers have found of great value to them may be taken from them at the discretion of a public administrative board. Even if it is still permitted its price will be, as indicated by Texas experience, substantially raised to the shipper and the rate is no longer to be fixed upon considerations of the cost of the service to the operator or its value to the shipper, but upon considerations affecting "other common carriers."

But this is not all. The small shipper may then have to give up this individual service or pay an excessive price for it. His powerful competitor, however, has no such hard choice. He can buy or lease his own equipment and thereby increase his competitive advantage. There is here a fundamental problem of national economics.

It should be plainly understood that state control of this type represents the end to which the efforts of those who advocate "regulation" are more and more tending. Plainly it is the type to which the principal advocates

—those who believe it desirable "to restore traffic to the rails"—will find most conducive to that end. The Texas statute has already been imitated in more than one state.

It is unnecessary to deny that regulation, at least of the common carrier, regular route, truck operation may have some theoretical advantages provided the free use of individual service is preserved to the shipper who needs it. It may, however, be laid down as a fundamental proposition, that whatever regulation is imposed should be in the public interest to promote the sound development of highway transport facilities and not for the purpose of repression or strangulation.

Yet such repression or strangulation is in many cases an avowed, and in nearly all cases an implicit, purpose of those who seek and defend this type of regulation. In fact, the whole legal support of the recent discussion of the Supreme Court sustaining the Texas legislation seems to be that its effect will be repression—if not strangulation; that it will reduce the number of vehicles on the highways and thereby tend to preserve the highways.

The engineering support for this contention, where modern highways are concerned, seems, if one accepts the conclusions of the U. S. Bureau of Public Roads, rather slender. Moreover, the loss of maintenance revenue—in gasoline and other taxation—from the trucks thus driven off the roads must more than offset any possible savings in maintenance.

A more serious off-setting factor from the point of view of the taxpayer is the cost of administering a system of police supervision necessary to control the operation of millions of vehicles by millions of individuals. In the opinions of many, railroad regulation itself has not been a success commensurate with its enormous cost. Yet 85 per cent of the railroad mileage is controlled by 15 systems and there are 2,500,000 individual truck owners who own one vehicle each.

It is manifest that the railroad problem is a major problem of fundamental importance to the country. It is by no means so clear that the influence of truck competition is a major factor in that problem. Railroad statistics relating to current operations must be read in the light of general business conditions. But the Interstate Commerce Commission has estimated (Docket 23,400) that in 1929 the trucks moved, in intercity traffic, about 6 per cent of the tonnage moved by rail. Nor does the railroad answer that this was "the cream of the business" seem very convincing in view of the further finding that this truck movement amounted only to about 8 per cent of railroad freight revenue.

As a matter of fact, the tonnage moved by truck was in large measure less than carload short-haul traffic which, because of the heavy proportion of terminal and accounting expense, yielded very little *net* revenue to the rail carrier. As a further matter

of fact, much of the intercity traffic handled by truck was traffic which was not competitive with the railroads and of that which was competitive, a very large part was carried by privately owned and operated trucks.

It follows that the case for restrictive regulation is far from being proved by alarming assertion as to the effect of the truck upon the investment of the railroad security holders. On the other hand, the burdens which it will impose upon industry which uses trucks, the truckman who operates them and the taxpayer who pays the costs of bureaucracy, attest that the proposition of such regulation is not consonant with the public interest.

It should also be borne in mind by those considering the problem that the end which is sought by the railroads in their agitation for restrictive legislation of motor truck service will be only partially served when the carrier for hire is driven from the highways. The next and obvious step will be an effort to limit in like manner the privately owned truck used exclusively in the service of its owner.

Once the country is committed to the principle of controlling all traffic movement by legislation and not by competition, we shall be embarked upon an experiment whose complications and end no man can foresee.

A Plague of Taxation Menaces Motor Trucks

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rail facilities! In other words, railroads handling more than 20 times as much revenue traffic as the trucks paid in taxes 30 million dollars less than was paid by their "competitors". Nor, should it be overlooked that the \$260,000,000 tax bill estimated for the railroads represents the taxes paid on passenger, as well as freight traffic. To obtain an accurate comparison of taxes paid by railroads and trucks, we would be justified in considering only that portion of the railroads' tax payment represented by their freight operations.

It is also important to remember that the truck statistics just cited embrace *all* trucks, of which something more than 75 per cent are 1½-ton, light-duty type used so commonly by neighborhood merchants, small factories and farmers in services confined to very limited areas.

Perhaps the most potent statement of the trucks' case with respect to taxation is that of Thomas H. MacDonald, Chief of the U. S. Bureau of Public Roads, who, in his appearance before the Interstate Commerce Committee, testified, "In my judgment, the heavier trucks and buses by the higher tax which they are paying, and particularly through the collection of gasoline taxes, are fully meeting all excess costs of (highway) construction, due to the increased thickness (of pavement) that is made necessary for their heavier loads."

TRUCK LEGISLATION SHOOTS UP COST OF FEEDING THE PUBLIC

This statement of the importance of trucks and the effects of truck restrictions and taxation in the Kroger Company's operation may be considered typical of every chain and independent food store in the country. It shows clearly how unreasonable truck legislation affects the purse of every voter.

THE Kroger Grocery and Baking Co. operates a large grocery chain in the Middle Western section of the United States, from Pennsylvania on the east to Wisconsin on the west, Oklahoma City on the southwest to Virginia on the southeast.

This company finds it absolutely essential in its operations to use the most efficient form of motor transportation in distributing its merchandise from warehouse to stores, that is, a service that must under all circumstances be handled by motor transportation and could not, under any conditions, be accomplished by railroad or other means, inasmuch as the stores are located short distances apart and extend out for 50 or more miles from each branch warehouse. Door-to-door delivery is therefore of much importance and the success of the entire operation is dependent to a considerable degree upon the freedom with which reasonably sized vehicles with reasonable loads can be operated.

This company ships approximately 55,000 cars of freight by rail each year, and distributes this from warehouses to stores by truck.

We are therefore intensely interested in a satisfactory settlement of the controversy of the railroads and highway users on a just and satisfactory basis.

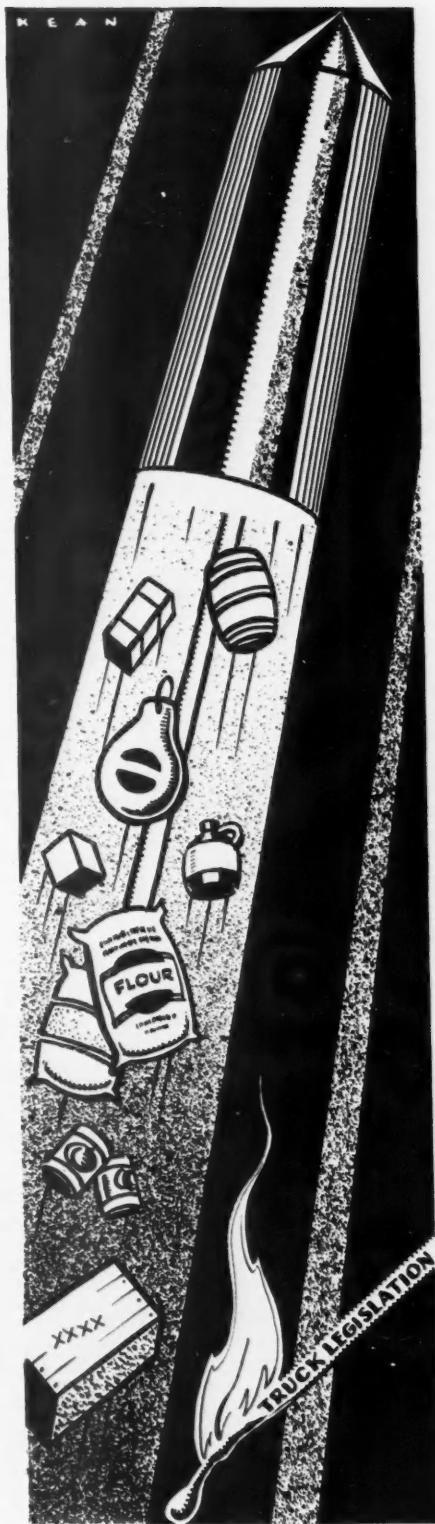
Economical distribution of merchandise to 4758 stores in 17 states requires the effective coordination of all forms of transportation. We have found that the motor truck is a vital part of this distribution machinery.

We have 21 concentration warehouses in 13 states. Each warehouse serves a group of individual stores ranging from 72 to 689. The transportation problem is one involving exactness in schedule, care in handling and economy. Railroads and waterways carry merchandise to these concentration points in economical heavy tonnage lots.

The motor truck is essential in the distribution of merchandise from the warehouse to the stores. This problem is one of handling efficiently many types of merchandise to widely scattered stores. The daily delivery of perishable merchandise to thousands of stores can only be accomplished

By COL. C. O. SHERRILL

Vice-President, The Kroger Grocery and Baking Company



Kroger Grocery Stores:

Ship 55,000 cars of freight by rail each year

Distribute this merchandise to 4758 stores in 17 States by truck

Find that daily delivery of perishables can only be accomplished economically by trucks

Estimates that restrictive legislation could easily increase truck hauling costs 25 per cent.

economically by the use of trucks and trailers.

Restrictive legislation is of vital interest to us, as its immediate effect is to increase our cost of distribution. The term "restrictive legislation" is of two types with reference to distribution cost:

1. Legislation that restricts the total payload that can be hauled by limiting gross weight, axle weight, length, width and height.
2. Legislation that imposes additional taxes.

Both of these forms of legislation increase transportation cost. Restriction of payload very often is the most important factor in the increase of trucking cost. An example will clearly show the effect of this form of legislation. Under the former highway laws in one state, we were allowed a total gross weight of 40,000 pounds on a tractor-semi-trailer. Now a new law limits our gross weight to 30,000 pounds with a tractor-semi-trailer. There has been a decrease in payload of approximately 5000 pounds. On a haul of 200 miles, this would amount to an increase in cost per cwt. of 4 cents, which is an increase of more than 25 per cent in cost. This amount of restriction in payload is not more drastic than that which is proposed in many states. Its effect on distribution cost is enormous.

It is recognized that motor transportation must carry its fair share of state highway construction and maintenance. The amount of taxes paid by motor transportation is assuming huge proportions. In many states trucks now pay the following taxes:

1. State gasoline tax.
2. Federal gasoline tax.
3. State license tax.
4. City taxes.
5. Mileage or ton mile tax.
6. Interstate license tax.
7. Federal tax on transportation equipment (trucks, tires, tubes, etc.).

The amount of these taxes is constantly increasing. In some states increased taxes have added three to

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A COMPARISON OF TAXES PAID BY HIGHWAY USERS AND CLASS 1 STEAM RAILWAYS

BY HIGHWAY USERS

1929	\$928-MILLION
1930	\$1000-MILLION
1931	\$1025-MILLION

BY CLASS 1 STEAM RAILWAYS

1929	\$403-MILLION
1930	\$354-MILLION
1931	\$308-MILLION

MOTOR VEHICLE TAXES ARE MORE THAN THREE TIMES THE TAXES PAID BY CLASS 1 RAILROADS

NUMBER OF EMPLOYEES IN AUTOMOTIVE AND IN STEAM RAILWAY TRANSPORTATION

SOURCE U.S. CENSUS OF 1930.

AUTOMOTIVE TRANSPORT EMPLOYEES 2,500,248

CHAUFFEURS, TRUCK AND TRACTOR DRIVERS
972,418

MECHANICS
394,188

FACTORY LABORERS and OPERATIVES
285,674

LABORERS ROAD AND STREET
307,027

CARAGE WORKERS
143,310

TRUCK TRANSPORT EMPLOYEES
1,002

NOTE: DOES NOT INCLUDE SALESMEN OR ALL TRUCK DRIVERS

STEAM RAILWAY EMPLOYEES-1,271,653

LABORERS
435,058

ENGINEERS
171,051

BRACKEN and CONDUCTORS
161,529

MECHANICS
112,089

TRUCK TRANSPORT EMPLOYEES
1,002

AUTOMOTIVE INDUSTRY EMPLOYS TWICE AS MANY AS THE STEAM RAILWAYS

ONE of the failures of democracy seems to be the reliance of the people upon the fancied ability of government to work some magical solution of their difficulties. It is from this order of intelligence that has arisen the plea for indiscriminate and unsound regulation of highway transportation. I do not, of course, refer to such regulation as is really necessary in the public interest—regulation, however, which should be essentially social in its import and not in any sense economic.

The origin of this agitation is simple to understand, but its implications are dangerous in the extreme. It arises, in the main, from the fact that the railroad industry has experienced a loss in traffic to the highway vehicle as well as a loss in traffic due to the depressed state of general business; that it is having difficulty meeting its fixed charges, let alone earning a satisfactory return on its invested capital; and that it is unable to meet highway competition effectively, partly because of restrictive regulation and partly because, at least to some extent, it is outmoded.

If we are to judge a policy by its fruits, the conclusion is inescapable that Government regulation, as we know it today, and as we are asked to consider it in terms of the automobile, is largely unwarranted and mostly harmful in its effects. And if the operation of an automobile must be wound around with the red tape of Government regulation of its traditional character, it will both add to the cost of living of the people and be of no particular benefit to the railroads, the automobile, or the public.

One of the difficulties about regulation is that once entered upon it is almost impossible to halt. First we

THE AUTOMOBILE'S TRANSPORTATION

start out to prevent discrimination. Then we have to establish rates. Then we have to know what the property is worth and what rate to establish to satisfy the investor. Then we have to forbid someone from entering the business because that would disrupt the system already established. And so on, until an unnecessary, unwieldy bureaucracy has been built up, sending out its tentacles in every direction.

It is such a system which has given birth to several doctrines of extremely questionable soundness at the present time. For example, that relating to valuation. Should not consideration be given to the proposition that properties are worth just what their service is worth to the country and not what it cost to build them or reproduce them regardless of the existence of other means of providing similar services? And in the matter of investment: Have we arrived at the stage in our economic development where railway investments must be protected at all cost, and given preferred consideration regardless of the repercussions of such a policy upon other lines of business and upon the development of improved transportation facilities of other kinds offering service to the American people? There is grave question as to the wisdom of an exaggerated calamity appeal on account

FACTS WHICH SHAKE THE CALAMITY APPEAL THAT MOTOR VEHICLES JEOPARDIZE HEAVY INVESTMENTS OF INSURANCE COMPANIES IN RAIL SECURITIES

Reserves in railroad bonds held by life insurance companies have declined from 36 per cent in 1906 to as low as 16 per cent today.

Should the inconceivable happen and all railroad bonds go in default the paper loss to the average policyholder would only be about \$48.

Motor vehicle owners of this country are paying in taxes more than \$1,000,000,000 a year.

of the investment of our insurance companies and other fiduciary institutions in railway securities.

It is doubtful that the facts will justify the implication of that appeal. In 1906 about 36 per cent of the reserves held by life insurance companies were in railway bonds, but the percentage has been declining steadily and is now only about 16 per cent. It can be readily figured out, of course, that if the wholly inconceivable happened and all the railway bonds in the country were in default, the paper loss to the average policyholder would be about \$48.

I do not believe that such doctrines should have any material weight in

RESOURCES OF SAVINGS BANKS, LOAN AND TRUST COMPANIES AND LIFE INSURANCE COMPANIES

SAVINGS BANKS \$12,513,189,000.

R.R. and OTHER PUBLIC SERVICE BONDS	A. OTHER BONDS, NOTES, WARRANTS, ETC.	LOANS ON REAL ESTATE	MISC.
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*A-STATE, COUNTY AND MUNICIPAL BONDS
*B-U.S. GOVERNMENT SECURITIES

LOAN AND TRUST COMPANIES \$16,860,990,000.

R.R. and OTHER PUBLIC SERVICE BONDS	U.S. GOVT. SECURITIES	LOANS ON REAL ESTATE	LOANS TO BANKS	OTHER LOANS	MISCELLANEOUS
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*A-RAILROAD AND OTHER PUBLIC SERVICE BONDS
*B-STATE, COUNTY AND MUNICIPAL BONDS

INSURANCE COMPANIES \$20,200,000,000.

R.R. STOCKS and BONDS	PUBLIC UTILITY BONDS	A. OTHER BONDS	FARM AND OTHER MORTGAGES	MISCELLANEOUS
-----------------------	----------------------	----------------	--------------------------	---------------

*A-STATE, COUNTY AND MUNICIPAL BONDS
*B-U.S. GOVERNMENT BONDS

Less than
TEN PER CENT
OF THE
ASSETS OF
FIDUCIARY
INSTITUTIONS
are in Railroad
Securities.

ESTIMATED PAYMENTS IN 1932 FOR TRANSPORTATION OF GOODS AND PERSONS ON STEAM RAILROADS AND ON HIGHWAYS

IN BILLIONS OF DOLLARS

ON RAILWAYS

FREIGHT
REVENUE
2.56

41 PASSENGER
REVENUE

TOTAL 2.97 BILLIONS

ABOUT \$3.47
is spent for
HIGHWAY TRANSPORT
for each dollar spent for
RAILWAY TRANSPORT

ON HIGHWAYS

FREIGHT
2.7 { 34-BILLION
TON MILES
at 8 CENTS
PER TON MILE

PASSENGER
7.6 { 19,000,000 CARS x 8000
MILES x 5¢ PER MILE

TOTAL 10.3 BILLIONS

CHALLENGE TO THE POLICY OF AMERICA

By B. E.
HUTCHINSON
Vice-President and
Treasurer
Chrysler Corp.



FACTS SHOWING HOW TRE-
MENDOUSLY IMPORTANT THE
MOTOR VEHICLE HAS BECOME
AS A TRANSPORTATION AGENCY
TO THE AMERICAN PEOPLE

In 1932 the movement of freight by trucks in the United States amounted to 34 billion ton-miles.

Truck transportation service in 1932 will approximate \$2,700,000,000 or slightly more than the estimated freight revenue of Class I railways of \$2,560,000,000.

For each \$1.00 expended with railroads for freight and passenger transportation \$3.50 is spent for motor vehicle highway transportation.

determining the country's transportation development and our public policy toward transportation agencies themselves.

It is advocated in some quarters that the rates charged by truckers be regulated by law. On account of the individual nature of truck haulage this rate regulation would be difficult. But let us look at the railway rate structure and consider if it is desirable to risk the imposition upon the truckers of such an unscientific, complicated and confusing thing as regulation has developed in the case of the railways. One of the maxims upon which railroad rate making has been based under this system is "to charge

what the traffic will bear." This means carrying some freight for less than the total cost of transportation.

The argument is that if an existing volume of traffic yields an income to cover all fixed charges, then additional traffic may be secured if it covers out-of-pocket expense. Rates are established which are below the total cost of transportation to meet boat competition, to meet competition from a rival railroad or to enable a commodity to be sold in a distant market. Of course where some merchandise is hauled at rates below the true cost, other merchandise must carry an excessive rate if the whole operation is to be profitable. So the trucker sometimes comes along and takes what the railroads claim is the cream of the traffic.

Then again regulatory commissions have approved certain rates in order to put certain cities, jobbers, or industries on alleged equality with their competitors. Of course this kind of rate regulation deprives certain cities and firms of economic advantages due to nearness to markets or raw materials. This kind of rate regulation, which seeks to keep everybody in business, is essentially uneconomic. It causes goods to be hauled by rail when they could be moved more cheaply by boat; it causes goods to be hauled

over circuitous routes when direct routes are available; it enables a distant producer of raw materials to out-sell a producer nearby; in general, it induces a maximum amount of traffic, while the interests of society require that traffic be kept to a minimum.

Instead of seeking to regulate rates charged by truckers, might it not be better to modify the existing rate structure of the railways? The inherent economics of truck transportation must eventually develop truck rates based primarily on the cost of the services rendered. If truck competition is disturbing to the existing railway rate structure because the railways have failed to give adequate consideration to the weight of the goods, or the distance hauled—because railways in the days when they largely monopolized the transportation service rendered in this country developed their rate structure under the theory that certain goods need not bear their full share of all charges—because rates charged various communities have been arbitrarily equalized regardless of the cost of the respective transportation service performed—should an inherently unsound railway rate structure be perpetuated at the expense of the public by extending its principles to the regulation of truck rates?

Is it not pertinent to inquire if the interest shown by railroads in the regulation of truck rates may not be primarily with a view to keeping them high?

If such is the case and if it is only

by arbitrarily increasing the cost of highway transport that traffic can be again diverted to the rails, is it in the public interest?

Altogether aside from the question of the practicability of regulating the automobile, it is not necessary to regulate it either as a monopoly or because of the rates which it charges. If you wish to ship goods by automobile and you think the trucker asks too much, you can readily get another trucker. No one has a vested right to serve your transportation needs. The conditions which gave birth to railway regulation do not apply at all to automobiles, and, as I have already stated, in large part their need as applied to railways has long since ceased to exist.

It is a question whether the average citizen realizes the extent to which various commissions which regulate highway transport at the present time are attempting to monopolize the use of the highways and to say that this man may drive his vehicle over the highway for a certain purpose but that that man may not do the same thing. In fact, one of the dangers which confronts us is that the highways, which are built and owned by the public, shall be monopolized and "farmed out" to certain firms and individuals. To what extent the practice of issuing certificates of convenience and necessity may enable certificated companies to become in this way "legalized" monopolies requires a careful inquiry before the country commits itself to such a policy.

The simple fact is that there exists no need for regulation of trucks, except in regard to matters of safety and adequate taxation. Whatever regulation is necessary should be altogether social in its character and not in any sense economic. Length of trucks on the highways should be limited so that a passenger car may pass the truck with safety. Trucks should be required to be equipped with safety appliances, lights, brakes, etc., and they should have such wheel equipment as not to damage the highways.

Highways and Taxes

In respect of such matters as automobile damage to the highway, automobile taxation, and even the use which the automobile makes of the highway, there is evidently much confusion of thought. The engineering facts are that a highway must be built of a certain thickness in order to withstand the effects of the elements, the warping and cracking due to the weather and seasonal changes. When the road has been made thick enough to stand all of this, it is equally able to transport anything up to and including a three-ton truck on pneumatic tires without any damage whatsoever to the road. The destructive factor is not weight or size but the pressure per square inch of tire surface in contact with the road. Thus a 10-ton truck equipped with six pneu-

matic tires might exert on a highway a much smaller pressure per square inch than a five-ton truck equipped with only four wheels and four tires.

When the automobile appeared, it became necessary to build better and more desirable highways, and the general practice obtained of using the money from license fees and gasoline taxes to building and improving them. During the past few years, about one-half of the money required to build and maintain highways has been contributed by automobile owners in that form. The fact remains, however, that the highways, directly and indirectly, are necessary for the use of everybody and at least part of their upkeep is not an inconsistent charge against public funds.

Pays One Billion

Perhaps the proportion of highway funds secured from general taxation and from levies on automobile users should be changed. I do not know. That is a question for factual determination. That would seem to be little if any justification for regarding highway transportation as subsidized when already the automobile owners of this country are paying in taxes more than one billion dollars a year.

HIGHWAY USERS PAY TAXES SUFFICIENT TO MAINTAIN THE HIGHWAYS AND PAY 5% INTEREST ON THE INVESTMENT IN HIGHWAYS		
ANNUAL TAX ON HIGHWAY USERS \$11,025,000,000		
LICENSE FEES \$344,000,000	GASOLINE TAXES \$537,000,000	PER PROB- MUNICIPAL TAXES \$145,000,000
ESTIMATED COST OF HIGHWAY MAINTENANCE WITH INTEREST \$11,125,000,000		
MAINTENANCE \$500,000,000	INTEREST ON 12% BILLION DOLLARS AT 5% \$625,000,000	
GOVERNMENT SUBSIDIES FOR HIGHWAY TRANSPORT ARE NEGLIGIBLE		

In determining the place of the automobile in American transportation some consideration, it would seem, should be given to the changing character and conditions of modern life. A number of factors are operating to change the nature and volume of our transportation requirements.

Thus railway transportation is likely to be continually affected both by a reduction in total transportation and by a diversion to trucks, passenger automobiles, pipe lines, boats, etc.

It is doubtful whether the American people have any adequate conception of how tremendously important the automobile has become as a transportation agency, first on its own account and second as a stimulus to improved methods of distribution and transportation generally. Available statistical data afford only a partial basis for estimating either the volume or the character of this service.

Dodge Brothers Corporation, in connection with its extensive truck and bus business, have been for years in-

vestigating various factors in connection with the transport of merchandise by trucks, and their studies have developed many interesting and important facts upon which certain specific conclusions have been based. One conclusion from these studies is that in 1932 the movement of freight by trucks in the United States will amount to 34 billion ton-miles. This is approximately one-eighth of the total ton mileage of freight when railroad transport is included. Incidentally this represents a shrinkage in truck ton-miles of approximately 30 per cent from the peak of about 50 billion ton-miles hauled by trucks in 1929, a year of exceptional prosperity for railroads.

The comparative money valuation placed by the American people on truck and railroad transportation of merchandise is interesting. Truck transportation service in 1932 will aggregate approximately \$2,700,000,000.00 or slightly more than the estimated freight revenue of Class I railways of \$2,560,000,000.00. The average ton-mile revenue of trucks is higher than the railroad average by several times over, but it must be considered that the truck revenue is secured from relatively short hauls, and from what would be classified by railroads as L. C. L. freight, upon which freight tariffs are higher. The important thing to note, however, is that this revenue was earned by trucks upon service that was either not available at all from railroads, or that was awarded to trucks competitively upon the value of the service rendered. In either event it represents a sound basis of evaluating the trucks' service to society.

A similar comparison of steam railway passenger revenue with an estimate of the expenditures on passenger car operations indicates an even greater preponderance of value awarded automobile passenger car transportation. Combining freight and passenger car figures, there is expended upon truck and automobile transportation, for freight and passengers, somewhere in the neighborhood of \$3.50 for each \$1.00 expended with steam railroads.

Public Concerned

It would seem only natural that, if the American people spend this huge sum for the transportation services performed by the automobile, they are vitally concerned in whatever affects a service which they appear to value so highly.

For a number of years Chrysler Corporation has kept a record of the occupations of the persons or firms buying its trucks. The occupational groups which have purchased over 5 per cent of its annual output of trucks are general truckers, grocers, department stores, miscellaneous retailers, dealers in milk and milk products, dry cleaners, dyers and laundrymen. The largest buyers are the general truck-

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Our Own Ear to the Ground Department

Stops Stalling

Several large milk dealers recently had the pleasure of driving a new Dodge house-to-house delivery job equipped with a hydraulic clutch. Pushing the accelerator gives a smooth start in any gear. When climbing steep hills lower gears than high may be required, as in conventional vehicles, but if the driver attempts the climb in high the truck will finally slow down and stop with the engine still running.

Look for Yourself

A glass spark plug which permits a mechanic to note the color of flame in engine cylinders is being tried out by large fleet operators. One reports that the plugs reveal uneven distribution of gas to individual cylinders. Occasional misses are revealed clearly.

Tunnels Out

The low floor level in the driver's compartment of most house-to-house delivery jobs makes it necessary to cover the propeller shaft with a steel "tunnel" which obstructs the passageway. One engineer is working on a design with the propeller shaft level all the way to the front and the power from the engine dropping down to the shaft after the manner of the FWD transfer drive. There will be no tunnel.

A Coasting Milk Unit

Coasting is one of the accomplishments of the International Harvester Model M-2 milk delivery unit. The vacuum-operated clutch releases as soon as the driver takes his foot off the accelerator. This permits him to stop and restart without throwing the gear lever in neutral or shifting into gear again.

Just 'Round the Corner

Power-operated clutches, brakes and other controls seem on the way. Power steering is probably not as far around the corner as prosperity.

Is \$500 Right?

We don't as yet know the prices of John Willys' new offerings, which include a four-cylinder light delivery. But our guess is that it will be priced less than, or at least very close to, \$500.

Getting Within the Law

Engineers spurred by threats of further legislative restrictions on weight are weighing relative advantages of lighter alloys or stronger alloys permitting smaller sections. In the former group are aluminum and even magnesium alloys and in the latter special steel, which will be just about as light as aluminum when made of comparable strength. Very light weight experimental trailers are being successfully operated in regular service.

Not Too Tough

Speaking of alloys, brake drums are being made of a new steel alloy containing a high percentage of manganese. Ordinary manganese alloys are so tough they cannot be machined, but heat-treatment makes it possible to overcome this characteristic.

Factory to Garage?

We are going to be rather interested to know how distribution is going to be handled if and when Continental Automobile Company announces a light delivery model on their new four-cylinder line. As you probably have heard there is going to be a lot of "direct-to-consumer" merchandising on this line of passenger cars. What about a light delivery, Mr. Krohn?

Cast Iron Crankshafts Again

Crankshafts of cast iron may appear in production during 1933. Not ordinary stove castings but alloy iron cast in a special design. The shafts are likely to be better and cheaper, say engineers working on the idea. Engineering experience shows that wear on ordinary crankpins takes place on the inner side, that is, opposite the side receiving the explosion. Cast iron shafts show a surprising increase in fatigue value over steel shafts when operated to destruction with the center main bearing purposely sprung .030 in. out of line, according to J. B. Fisher, chief engineer of Waukesha. Other companies are known to be experimenting along these lines. It may be recalled that rumors predicted a cast iron crankshaft for the new Ford V8 and the ground-contacting ear stationed at Dearborn reports that the idea has not been abandoned.

Sumptin' New

One important company not far from Detroit will announce several new models and a completely new engine, which they build themselves, at the Chicago Show.

What's Your Guess?

Announcement of the Plymouth with a six-cylinder engine leaves the Chrysler group without a single four-cylinder engine in its passenger-car line. Which inspires a question about the type of engine to be used in 1933 in the Dodge trucks rated at from 1/2 to 1 1/2 tons now available with either fours or sixes. The e. t. g. prophet is making one guess. What is yours?—A.F.D.

THE OVERLOAD



Heah's an ovahload, suh, what am an ovahload. Right smack from deah ol' Alabammy.

Technocracy!

Looking over the preliminary facts and figures just issued by the N.A.C.C., and the 1932 truck production figures in particular, we are inclined to shout a loud "second the motion" to the observation of C. F. Kettering, of General Motors, when he said in defense of the machine age, "We suffer not from overproduction, but from under circulation."

The Regulatory Parade

As a protection to established merchants, who pay state, county and school taxes and in fairness to rail and motor common carriers certain

truck users will be required to pay an occupational tax if a measure to be presented to the next Texas Legislature by the Texas Industrial Traffic League is enacted into law. The law will apply to anyone, who buys merchandise at one point, hauls it to another point and sells it.

A Pink Slip

Here's a bit of evidence which proves that all's not blue that comes on a pink slip. It came as a printed memorandum from a well-known truck maker for sales department and not editorial consumption: "The belief is growing around here that every salesman ought to receive Commercial Car Journal regularly for his own benefit**** Be sure that every salesman reads 'Stop Hand-Pressing Only; Get Back to Bare-Handed Selling' on page 17 **** be sure to read the article on rating formulas, page 26. That gives the kind of information by which problems, both theoretical and actual, are solved by successful truck salesmen. And so on—." Needless to say we are sold on such pink slips.

Nuthin Like the Real Thing

At last the much misused term "unique" has been given an opportunity to display itself in its true sense. To say the least, the splendid Chevrolet exhibit at the New York Show was unique. By means of real half-smokes, beautifully colored bananas, living gardenias, hard red bricks, nuts and bolts, cans of refrigerated milk, etc., the vocational versatility of the truck was demonstrated in a way as to satisfy even the most skeptic from Missouri. Besides filling the trucks with the real thing, posters suspended from the beams depicted the trucks as they appear in their various services.

Move Over, Please

Don't be surprised if a truck manufacturer comes out with a model equipped with a loud speaker close to the driver's seat. It is reported that the amplifier will play a prominent role in helping to overcome the resentment of the public toward the appearance of a truck on the highway. Signals of a motorist requesting the right of way will be instantly picked up by a receiver at the rear of a truck and transmitted to the driver.

Scrappy Advertising

Is it good advertising to fight for your rights and tell the world about it? Ralph J. Staehli, secretary of Allied Truck Owners, Inc., says yes and presents the story of one truck operator who noted an increase of 22 per cent in business above normal as the result of the advertising campaign put on by the highway users of Oregon in the recent battle against the railway proposal for a truck regulation bill to inform the public of the economic and industrial value of highways to each section of that state.

Rubinoff Leads Off

Pianists and violinists are preferred over all other instrumentalists in a national radio star popularity contest. Rubinoff, violinist, is the leading artist, but piano players lead with 28 1/2 per cent of votes. These interesting facts are furnished by United American Bosch Corp.

The Fact of the Matter

The popular notion is that somebody, a flock of somebodies in fact, must do something to help the railroads. Daniel Willard, speaking with authority of the position of president of the Baltimore and Ohio brings the informal ideas down to earth with the statement "Our problems on the Baltimore and Ohio will disappear as business improves."—M.J.K.



22 FUNDAMENTALS TO GUIDE TRUCK REGULATORY THOUGHT

Effect of Highway Transport on Rail Freight

1. Sub-normal shipping by industry, mining and agriculture is the principal cause of low freight revenues of railroads.

2. The most stringent restrictions likely to be suggested for motor services whose business and rates might be adjudged subject to public regulation would bring no marked increase in rail net freight revenues.

3. It will require a study of net railroad earnings, rather than tonnage, and at a time when agriculture, mines and industry are producing in normal volume to get a true picture of railroad conditions as affected by the so-called motor competition.

4. No material approach to the real difficulties of the railroad industry can be found in "losses" to motor services since the major part of those services is for short distances that would produce small line haul earnings and disproportionate terminal expenses.

Should Motor Vehicles be "Regulated"

5. No increase in public expenditures for regulatory bureaus should be considered unless supported by the most urgent public necessity

As Expressed in a Memorandum filed by National Automobile Chamber of Commerce With National Transportation Committee

and convincing evidence of tangible result.

6. The motor vehicle is a major and necessary addition to the transportation service of the United States. It is not a competitor of the railroads in the sense of furnishing identical services.

7. Generally its field of service is distinct from the rail-head to rail-head service of the railroads; it is individual and flexible in character, operating at any time from door to door.

8. The public is primarily interested in police regulation of motor vehicles such as registration, sizes, weights, speeds and conditions of operation; these features are within the control of each state, are being

cared for according to local conditions and are being constantly perfected.

9. The uniform standards for dimensional control of motor vehicle operation set forth by the United States Bureau of Public Roads and the American Association of State Highway Officials should be approved by all state Legislatures in the interest of efficient transportation.

10. Any undue restrictions on contract or common carrier trucks would create an advantage to competing business served by its own trucks.

11. Regulation of railroads was founded on monopoly and was not at once adopted in its present form; any regulatory suggestion for motor transport should be approached slowly and carefully lest public interest suffer.

12. Any restrictions on motor transport founded only on an attempt to make motor services equal in cost the dissimilar rail-head to rail-head services would be unsound and ultimately futile; it would repress full development of motor transportation and only operate to the eventual disadvantage of the shipping public, the consumers, and the railroads as well.

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HEAVY GAS TAXES CRUSH GAS AND VEHICLE SALES

THE petroleum industry has this year provided an impressive demonstration of the ruinous effect of excessive taxation. High taxes have been resulting in decreased consumption of motor fuel and, in almost every state, lessened registration of motor cars. It is pretty generally realized now that gasoline is the most heavily taxed article of general consumption in the country; with the imposition, at the end of June, of a 1 cent Federal tax, the levies against it are, on an average for the whole country, equal to about a 100 per cent manufacturer's sales tax. There are few industries that could carry such a burden of public charges and survive.

The worst thing about it, however, concerns the inequalities in imposing the burden. Taxes range from 2 cents in some states to 7 cents in the highest group—besides the Federal tax. Then, city and county taxes, additional to all these, are getting increasingly fashionable. Counting these, the gasoline tax is actually as high as 12 cents in one place. Even if the consumer could stand it, this sort of thing is so utterly demoralizing to markets that it brings bootlegging, corruption and graft into the business.

When Congress enacted the Federal gasoline tax last summer some innocent people imagined that it would help to overcome the bootlegging and racketeering. They assumed that the

By J. HOWARD PEW
President, Sun Oil Company

THE EFFECT OF GAS TAXES ON GAS AND VEHICLE SALES

Number States	Gas Tax Cents	Gas Sales Loss %	Car Sales Loss %
12	3	1.3	1.2
17	4	5.4	4.5
9	5	8.9	5.5
5	6	9.2	9.0
2	7	13.3	

Federal authority would frighten the racketeers, who had defied the states, into being good. Of course, it had no such effect at all. The racketeers are so well organized and financed that they don't fear any authority. Only a day or two ago it was announced from Washington that frauds had been perpetrated against the customs duty on gasoline on a huge scale. Congress recently imposed a tariff of 2½ cents a gallon on imported gasoline, but the only effect was that the racketeers started importing naphtha instead of gasoline and selling it as motor fuel, the duty on naphtha being only ½ cent a gallon. This substitution of an inferior article is of course a fraud against the Government and the motorist; but it had assumed such proportions that the Government was compelled to raise the duty on naphtha to the same figure as that on gasoline.

The worst difficulty, as I see it, is that there is so much discrimination in the distribution of the tax burden. Taxes, of course, ought to be kept as moderate as possible; but it is even more important that they be equitably distributed. Three states and the District of Columbia tax gasoline only 2 cents a gallon; and in all these low-tax areas, gasoline consumption increased, during the first half of 1932, as compared to 1931, nearly 7 per cent. But as the rate of tax went up in other states, consumption went down. (See the tabulated figures.)

Now, it had become almost a rule, in normal times, that gasoline consumption would increase about 7 per cent a year; that was normal. Well, the states with a 2 cent tax showed just about that rate of increase this year; in all the others, consumption went down as the tax went up. There could hardly be a better demonstration that a gasoline tax at 2 cents is just about the ideal rate.

Whenever taxes get excessive and discriminatory in one industry, the effect is bound to be felt in others; thus the excessive levies against gasoline have been promptly reflected in a decrease in motor car registrations. Dividing the states into groups according to their rates of gasoline tax, we find that the number of cars registered in 1932 actually gained 1.3 per cent in the three states and District of

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The Legislative Wolf Is An Obstacle To Truck Progress

CONTINUED FROM PAGE 10

that he was not much interested in legislation.

This same manufacturer recently has been holding old-fashioned sales dynamiting sessions, old "Come-on-boys — we'll - show - 'em - how" stuff—taking midnight trains between points, without aiding much to clear the way for sales in this or any other territory.

We'll guarantee right now that his sales will keep on slipping and will continue to slip until the industry as a whole steps into this legislative picture determined to recognize that it is the biggest single obstacle to sales in the truck field today—even greater than the complacent assumption that business hasn't money to buy trucks.

The case of a woolen mill that has prospered on deflation, is an example. The depression made local markets for the mill and it was in the market for a truck. The truck was to serve in distributing semi-finished goods between a plant in Oregon and a plant 45 miles away in Washington.

Truck salesman Number 1, selling a small truck which, with a semi-trailer, could have handled the load, pointed out to the woolen manufacturer that heavier trucks would be barred after the passage of a railroad bill and that he would be foolish to buy anything but light equipment.

The second salesman assured the prospect that to carry his requirements, he would have to use a single truck of ample capacity as the railroad bill. (he did not think that the railroad bill could be defeated) would bar the semi-trailer because of engineering requirements. The bill didn't do anything of the kind, but the prospect would have been just as doubtful about it as the salesman had he attempted to wade through the 6000-word railroad-initiated measure.

The issue was settled with the mill deciding not to buy a truck.

Until the legislative skies clear a contract carrier with an old overhauled job is doing the hauling. The woolen mill owner is not proud of the equipment but in the meantime he is not going to invest his money in any equipment that may be confiscated by law in 60 days or else be subject to an expensive rebuilding job.

The logging business offers another example of the effect of legislation on a market. My friend in the truck business today would be foolish to sell a truck logger a piece of equipment. So would any factory branch or any dealer in this territory who expected to make anything on the sale of the highly specialized equipment required for the service and had only earning capacity to look to for sales security. This of course assumes that the deal would be a typical log truck deal, one-third down or 40 per cent down and the contract to pay out the rest of the purchase price of the truck.

In Washington and Oregon, coming sessions of the legislature are almost certain to work new regulations and restrictions on truck logging.

What assurance has the logger or the truck dealer back of him as to the nature of the final laws?

Neither manufacturer nor anyone else is making much of an effort, to date, to shape those laws. Will blind public prejudice, abetted by the railroads and their legal staffs, who see a chance to eliminate some trucks, guide that legislation onto the books, or will truck transportation experts make the few fundamental corrections that will satisfy public demand and still not disturb the operator or the dealer interest?

If the provisions of the late West-Railroad bill in Oregon had become law, 1800 log trucks in that state would have been tied up immediately. Finance companies, first, and dealers after the finance companies had hauled them back out of the woods, would have had a beautiful mess of used equipment to work and weep over.

This bill received but scant attention from purveyors to the transport industry except a small handful of dealers and equipment manufacturers and a few tire companies located on the ground, who visioned the chaos if that bill had passed. The loss to the industry through junked equipment and uncollectable supply accounts would, doubtless, have run well over \$500,000, without considering the value of the market for future sales eliminated by passage of that bill.

Yet, it didn't bother anyone very much except the operators who visioned their families in the bread lines and their life's stakes gone.

The picture might be carried even further. Back of every log truck on the highways of Oregon and Washington are 40 men and 40 families. That 40 includes the men in the timber, the fallers, buckers, loaders, skidders, swamper and all the others. It includes the sawyers, sorters, carriage men, filers, pilers, handlers, checkers, and others in the mills that waited for the trucks to bring in the logs.

Fifteen thousand men would have followed the truck operators into the bread lines and a lot of private passenger cars would have gone back to the finance companies and dealers.

And, yet we're told this is an operators' battle!

Operators of Oregon, largely, except for the loyal seven dealers and factories back of them, staved off this calamity to the truck industry. Yet, it was everybody's battle, the battle of everyone who still thinks the automotive industry, in any form, is a field worth fighting for!

If one of the large tire companies supplying the hungry market in the log truck field had visioned some competitor getting away with \$100,000 annually of its market, it would have been much concerned. This bill if it had passed would have lopped off a quarter million market for rubber in

the logging industry alone. But no one was much concerned about it, except a few local tire dealers who visioned some of their pet accounts going off the books for good.

The effect of the bill on other carriers would have meant that in this one state alone a million dollar rubber market would have been cut off.

In every state within range the same conditions hold true.

The picture is not hopeless and some idea of a new day has appeared in recent weeks in the activity of the National Highway Users Association. This deserves every encouragement but more than that is required. This group is only a beginning.

The automotive industry is notoriously weak in its politics. It likes to assume that it is self-sufficient and it is not. The dealer-mortality in the depression should be one eye-opener. The ability of almost any commercial adversary to take the measure of the automotive industry politically should be another.

Oregon trucking won its first big battle politically only because it refused to apologize to the enemy and played the game just the way the railroads wanted to play it. The truck and allied industries in Oregon were saved a huge potential loss by recognizing legislative hazards as business handicaps and proceeding to remove them. The same thing can be done nationally, but it will never be done under a "let-George-do-it" plan.

That is the present attitude of most manufacturers of trucks and of allied products, and why their loss of markets will become embarrassing unless they put behind the legislative fight the active support of their entire factory and field organizations.

Automobile's Challenge to the American Transportation Policy

CONTINUED FROM PAGE 20

ers, but they buy only one-eighth of the output. Groups that buy between 5 and 3 per cent are wholesale bakers, contractors and retail bakers.

Those occupational groups that buy over 2 per cent of the output but less than 3 per cent are public utilities, manufacturers, gas and oil dealers, meat market and fish dealers and city, county and state institutions. It is perhaps reasonable to ask, as you look over this list, whether the people who buy these trucks are really in need of rate or monopoly regulation.

In the end, of course, the most economical forms of transportation will survive, preserving to the people of the country the benefits which each form can contribute in the field in which it is best adapted to serve.

How rapidly we arrive at a sound solution of America's transportation problem depends in large part upon our willingness to let economic forces rather than artificial restrictions determine the extent to which each mode of transportation will prevail.

VISCOSITY CHANGE IN A PERFECT ENGINE REFLECTS OIL QUALITY

How Oil Acts in the Crankcase

Engine oils composed of a mixture of light and heavy oils increase in viscosity in crankcase service.

Ability of crankcase oil to resist decomposition by heat and agitation depends upon the rate of increase in viscosity.

Oils of high viscosity used in engines requiring low viscosity oil act the same in the crankcase and apparently have the same lubricating value, irrespective of their cost.

An engine depends upon crankcase oil for lubrication, not upon new oil.

PHYSICAL characteristics of different engine oils vary decidedly even though oil chosen for comparison may have the same viscosity. If a quantity of light oil and a quantity of heavy oil are mixed together to make a medium oil, the viscosity of this mixed oil will change more rapidly in use in an engine than an oil composed entirely of medium oil. In service in the engine, the light oils evaporate quickly leaving the heavier oils which are more likely to decompose than the oils of lower viscosity and they produce an excessive tarry or carbon deposit. Instead of a mixture of light and heavy oils, an oil may be compounded of a number of different oils graduated in viscosity from very light to very heavy.

Change in viscosity of an oil is due either to the engine or the oil, as was stated in the preceding article. If we use an engine known to be in excellent condition and adjustment throughout, change in viscosity of the oil will be due to the oil itself and not to engine condition. Therefore, the engine can be used as a laboratory to determine the relative lubricating value of different engine oils. In addition, it is possible to determine when the crankcase should be drained. We shall discuss the use of the engine as an oil testing machine in this article and take up the oil drainage period in a subsequent installment.

We ran a series of tests using different oils in an engine that had been completely overhauled, was maintained in the very best of mechanical condition and adjustment throughout the test, and was operated daily under identical conditions serving a delivery route. The four different engine oils selected for this experiment are designated A, B, C and D. Each oil was first tested for its viscosity when new and it was found that for all practical purposes they were the same. Each

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By SILAS I. ROYAL

Lubrication Engineer and Oil Chemist

Unsuitable Oil Reveals Itself

This article and the accompanying charts, which are based upon actual tests, show how unsuitable oils reveal their shortcomings to keen observers. The test procedure which is of viscosity is simple but is not in the "rub-between-thumb-and-finger" class.

When to drain oil will be discussed by the author in a subsequent article, the third of a series.

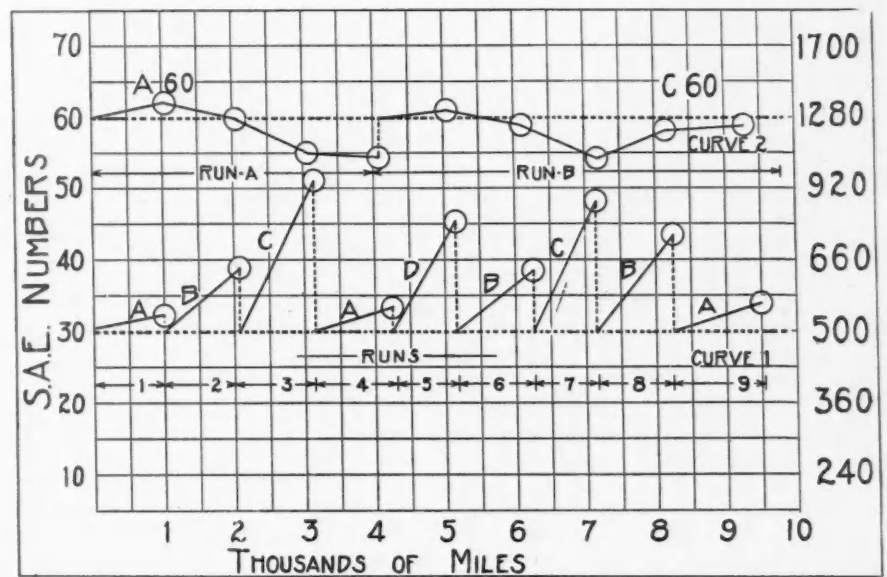


CHART 1. Lower curve shows increase in viscosity of different oils used in an engine in excellent condition. Oil A is an oil of known good quality. Upper curve shows action of good and poor oil of too high viscosity for the engine.

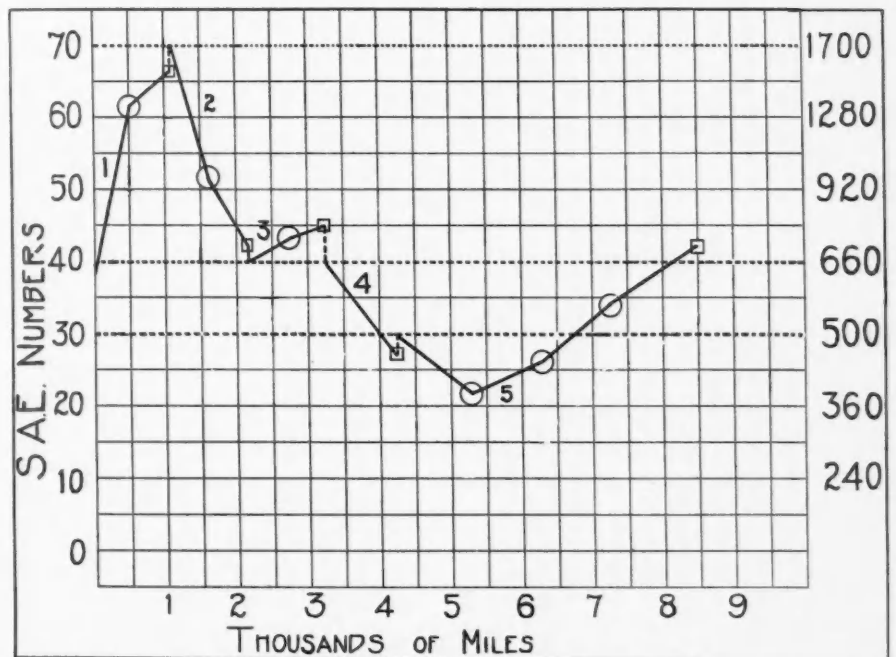


CHART 2. Change in viscosity caused by evaporation of pre-dilution (1), rich mixture and poor plugs (2), putting in new plugs (3), poor plugs again (4). Test run 5 shows dilution followed by evaporation of light ends in the oil leaving a heavy oil which continued to increase in viscosity. Figures on right of chart show the viscosity in Saybolt records.

MILLIONS FOR TRUCK INDUSTRY SEEN WHEN BEER FLOWS AGAIN



HOW much will the return of beer mean to the truck industry in dollars and cents?

R. A. Huber, vice-president of the United States Brewers Association and of the Anheuser Busch Brewing Co., is on record that brewers will spend \$15,000,000 for trucks the moment beer is legalized.

D. C. Fenner of the Mack company told the House Ways and Means Committee that in the first year after legalization the brewers will need about 5000 trucks costing about \$25,000,000.

Both these estimates consider only the sale of new trucks to the existing brewers—some 200-odd in number.

But to arrive at a more acceptable approximation of what beer will mean to the entire truck industry one must consider not only the sale of new trucks to the existing breweries but the sale of new trucks to new breweries which are certain to spring up; also how much may be spent to repair and overhaul truck equipment now in use; how much additional may be

spent for maintenance and operation, including salaries, insurance, gas, oil, tires, etc., and how much additional may be spent for garage and other equipment incidental to the operation and maintenance of vehicles.

Considering all these angles, the automotive industry stands to benefit to the tune of nearly \$43,000,000 from the existing 200-odd breweries alone, as shown in the tabulated survey in the adjoining column.

The estimates in the tabulation speak for themselves. Since they were submitted by brewers themselves, they possess a degree of authenticity which previous approximations have lacked.

It is interesting to note that in the matter of new truck sales, the survey estimate of \$13,788,000 checks closely with Mr. Huber's figure of \$15,000,000. The fact that it is way under Mr. Fenner's estimate of \$25,000,000 would seem to indicate—since both the breweries and Mr. Fenner agree that about 5000 trucks will be purchased—

Survey of 200 Breweries
Show That They Will Spend
More Than \$42,000,000
in the Automotive Industry

By GEORGE T. HOOK

Business from Beer

In this survey prepared for Commercial Car Journal, Morris R. Machol, manager of The Fleet Owner List Co., questionnaired the 200-odd breweries now operating in the United States, to find out their automotive requirements in the event beer is legalized. The analysis of answers he procured, follows:

1. Number of trucks owned . . .	4,146
2. Number of trucks may buy . . .	4,596
3. May spend for new trucks . . .	\$13,788,000
4. Number automobiles owned . . .	888
5. Number automobiles may buy . . .	4,962
6. May spend for automobiles . . .	\$2,977,000
7. May spend for repairing and overhauling present equipment . . .	\$6,217,400
8. Additional per year may spend for automotive maintenance, including salaries, insurance, gas, oil, tires, etc.	\$14,687,000
9. May spend for garage and other equipment incidental to the operation and maintenance of motor vehicles . . .	\$5,230,000
10. Total	\$42,899,400

that they plan to buy quite a number of trucks in the lighter capacities. Mr. Fenner's estimate appears to have been based on the assumption that trucks of five tons and up capacity would be purchased almost exclusively.

And yet it may be that the brewers, and not Mr. Fenner, will find themselves in error on their estimates if the modification of the Volstead Act takes such a form as to permit of distribution in barrels. In such an event the trucks of high tonnage rating would obviously win considerable preference.

All the estimates that have been quoted so far deal, of course, exclusively with the immediate prospects; with the potential among the 200-odd breweries now in operation. The larger prospect—the real potential—must not overlook the fact that with

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TRUCKING OF COAL FROM THE COLLIERY TO CONSUMER GROWS

An Impartial Discussion of the Development and Its Effect Upon the Coal Industry, Railroads and Truck Sales

By SPENCER A. JONES

Special Investigator

A Burning Question

Trucking coal from mine direct to the consumer has increased both in tonnage and average length of haul to such astounding proportions during the last 12 months as to excite considerable thought in all business circles directly affected.

Is the practice sound? How will it affect established channels of coal distribution? What will it do to producers, railroads, local coal dealers? What public support will it receive? Is the plan likely to become permanent or is it just another offspring of the Depression? And finally will it benefit or injure truck sales? These are some of the many questions that are being asked in many quarters.

Commercial Car Journal, sensing the many inquiries that would arise from the phenomenal mushroom growth of this new trucking development, decided to investigate. Its investigator spent days at the coal mines, on the highways and in various markets probing and studying. The results of his findings are not only interesting but contain facts from an economic and sales aspect highly significant to both makers and sellers of automotive equipment.

The study is presented in two parts. The first part, here presented, is a discussion of the development and its effects. The second, to appear in February, will be an analysis of economic phases of the operation, principally cost of operation, comparisons with established methods of distributing coal, and requirements for successful operation.

TRUCKING of coal from mine to consumer for distances of about 50 miles has been conducted profitably for several years, but it is only since 1930 that attempts have been made to increase the hauling radius. Even in 1931 there was comparatively little coal trucked for distances of more than 75 miles, but since January, 1932, both the hauling radius and the number of truckers engaged in the business have increased enormously.

The Commercial Car Journal



An impartial investigation of coal truckers disclosed that approximately 1000 trucks are bringing mine-to-consumer coal into northern New Jersey, alone, where a \$2.19 per ton railroad freight rate on coal is in effect. The average load is about 4 tons per truck. A careful check at the three bridges spanning the Delaware river, over which the greater portion of the coal is trucked into northern New Jersey, showed that more than 2000 tons are hauled across one of these bridges every 24 hours. Most of the coal trucks carried New Jersey licenses, only.

A great many mine-to-consumer truckers were stopped on the highway and questioned during the investigation. Nearly all stated that the reason they were hauling coal was because they already owned trucks but had no other work for them. A few owners stated that they had purchased new equipment for hauling coal because they had heard it was a profitable business. Some truckers claimed to

carry insurance, but most were vague or entirely ignorant as to the kind or amount carried.

Not all of those engaged in trucking coal from the mines are small fry. The Pennsylvania Coal Terminal, a concern at Newburgh, N. Y., trucks coal direct from the mines and retails it to their customers locally. Mr. G. L. Vande Water, head of the enterprise, says:

"We are severely criticized, even called 'bootleggers', because we have established a method for retailing direct to the consumer, for less money, as good a grade of coal as can be bought in the city of Newburgh or any other city. By going direct to the mines with our own trucks we are able to effect savings which we pass on to our customers.

"Of course it is easy to understand why the local coal dealers do not like our being in business. They claim that they cannot meet our prices, due to plant overhead and their present method of handling coal. If their present

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methods of trade can be beaten, then it is high time that they improve upon them."

Several of the larger concerns ostensibly engaged in the trucking and retailing of coal direct from mine to consumer are not actually owners or operators of trucks. They operate by making a deal with truck owners who are out of work. To these truckers they advance a certain amount of cash. The truckers drive to certain specified mines; buy the coal with the money advanced them, and haul the coal back to the concerns which advanced the money. The concerns then "buy" the loads of coal from the truckers at pre-arranged prices, but the sales are not actually consummated until the truckers have delivered the coal in the consumers' cellars. Such concerns secure consumers' orders through salesmen, but act only as "agents," which seems to relieve them from certain legal entanglements. The truckers, while they do not receive as much for their coal as if they solicited their own orders, are relieved of the expense of making sales, as well as having their coal purchases financed.

Retail coal dealers who own storage facilities, scales, delivery trucks and the other expensive paraphernalia of the established way of doing business complained heatedly to the investigator about the competition of mine-to-consumer truckers. One of the retailers who is on a committee to investigate ways and means of meeting trucker competition writes that "if nothing is done to stop this practice, it will only be a question of time when the producing companies will only be able to supply this territory (northern New Jersey) through truckers, railroad companies will lose their entire revenue from anthracite freight, and coal dealers be obliged to discard their yard equipment and also truck direct from the mines."

Railroad officials state that they are well aware coal is being trucked long distances from the anthracite mines, and consider their loss in revenue to be lamentably high. They, too, like the coal dealers, suggest that the consumer is the real loser because of the inferior quality of coal supplied by truckers, the shortweights and the loss in taxes.

The old line mine operators are said to maintain by mutual agreement what are known as "circular" prices. These "circular" prices appear to prevail for about 80 per cent of the anthracite coal mined. The balance of the anthracite coal is mined by so-called independents, and usually at somewhat lower prices.

The investigator interviewed the New York representatives of old line companies who claimed that their mines refused to sell to truckers, or that their prices to truckers were so high as to make long distance trucking unprofitable. Many old line companies, it was stated, are not even equipped with pockets for truck loading. As might be expected, the old line

company representatives accused the truckers of buying inferior coal from independent mines, and of delivering short-weight.

Through various channels the investigator was informed that some, but not all independent mines sell to truckers at prices which are attractive. He was told that, in general, the independent mines appear to be in favor of mine-to-consumer trucking even though they are not all in a position to sell to the truckers. The smaller independent operators, it was asserted, are the most active in promoting sales to truckers, their only complaint being that they cannot fill the trucks fast enough.

Then the investigator, posing as a trucker seeking sources of supply, visited the anthracite coal mining regions of Pennsylvania. Here he learned that most of the mine-to-consumer trucking into northern New Jersey originates in the Scranton region, although a small amount comes from the Lehigh fields. He made several attempts to purchase coal for trucking from old line companies, but in every case either a flat refusal was received, or else the prices quoted were higher than "circular" prices.

Glad-Handed by Independents

Then he went around among the independent mines, where he was given an entirely different reception. Practically all were willing, even anxious to sell to truckers. Not all, however, would quote prices which were attractive. It was at the "strip" mines, where veins are exposed near the surface, and at comparatively shallow workings, from which the coal can be removed at less cost than from the deep shafts of the larger workings, that the attractive prices were obtained. At all independent mines it was indignantly denied that their coal was in any way inferior in sizing or quality to that produced in old line operations.

He was told on good authority that one independent who is at present operating in Winton, Pa., has leased 1600 acres at Yatesville, Pa., where he is expecting to handle truck trade exclusively, supplying surface-mined coal.

Names of mines, prices paid and re-sale prices, which had previously been obtained by stopping and questioning truckers along the highways, were in practically every instance found to be truthfully given, when checked against the facts. In general, the price of coal delivered in the consumer's cellar by the trucker is about \$4.50 per ton higher than the price paid at the mine. For instance, independent mine prices of egg, stove and chestnut sizes are \$6 on the average, and the delivered price in the consumer's cellar is \$10.50 on the average.

It is this spread of \$4.50 per ton on which the mine-to-consumer trucker has to operate, as compared with the average spread of a trifle over \$5 per

ton out of which the established retailer pays freight, fixed charges, selling and retail delivery costs.

Truck manufacturers are becoming interested in the situation and its future possibilities. One manufacturer's branch manager recently issued the following bulletin:

"There is a mistaken belief that there is a lot of money to be made by individual operators purchasing new or second hand trucks and going direct to the mines for coal, to be hauled at great distances and sold to consumers, usually at lower than current coal prices.

"We, here, have lost a great many sales, because of our inability to determine how a healthy, profitable business could be built for this or any other company from this classification of users, especially at distances 50 miles or more from the mines and the purpose of this letter is to caution you against submitting any time deals to our Credit Department and in turn to our Collection Department, because we cannot consider the sale of a new or used truck to this class of users for any less than 40 per cent or 50 per cent cash down-payment, because of the fast depreciation and the probability of a repossession, due to the business ability of the customer involved.

"We doubt the wisdom of promoting sales to this class and if we do, we are unconsciously tearing down one of the finest markets we can hope to find, namely: the retail coal dealer.

"The coal dealer ranks at or near the top of the list when it comes to pay, practically 75 per cent of all truck purchases have been cash to date. His business usually is a neighborhood business, he is not prone to overloading and his equipment is not subject to fast deterioration, in fact we do not know of any class of business that is more worthwhile, more desirable than that of the retail coal industry.

"There is little that we, as a company, can do to stop the inroads of this irresponsible competition the coal men are everywhere confronting today, but we can at least make our trucks harder to buy for this use and thereby protect this company against losses, which are sure to result in the majority of sales to these independent haulers.

"Several coal dealers have found economy in truck and trailer operations from mines to their yards, and naturally this opinion does not apply to this class of work."

This truck manufacturer, and others, are adding a clause in lease contracts providing that time payments shall be made on a mileage or monthly basis, whichever is greater; the average allowable monthly mileage being much less than that customary in the mine-to-consumer trucking business.

Retail coal dealers criticize both the

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N. Y. C. SHOP SWEEPS OUT WASTEFUL REPAIR PRACTICES

Department of Sanitation
Uses 7 Devices in Clean-
ing Up Its Troublesome
and Time-Consuming Jobs

THE machine shop of the Department of Sanitation in the New York City Central Motor Repair Shop building has designed and built a large number of special jigs and fixtures to simplify specific operations which otherwise would be troublesome or time-consuming. Several of them are pullers for flanges and gears which are "worth their weight in gold."

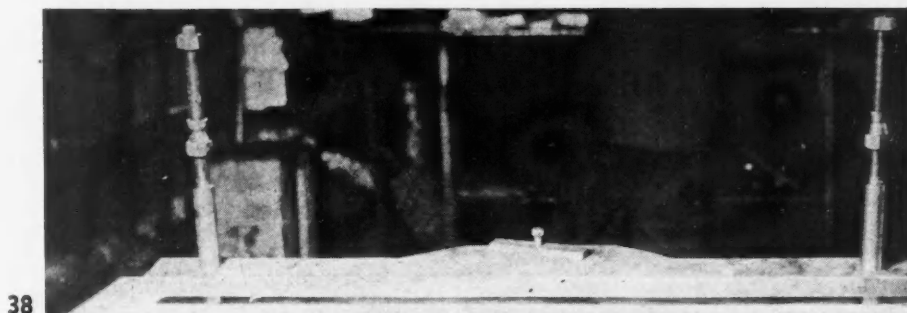
This is the fifth of a series of articles describing the shop-made devices used in the three city department shops comprising the New York City Motor Repair Shop building, the world's largest fleet maintenance establishment. Another group of devices will be described in an early issue.

Revelation of this information is possible because of the courtesy of Albert Goldman, commissioner, Department of Plant and Structures; Dr. William Schroeder, Jr., chairman of the Sanitary Commission of the Department of Sanitation, and Edward P. Mulrooney, commissioner, Police Department.

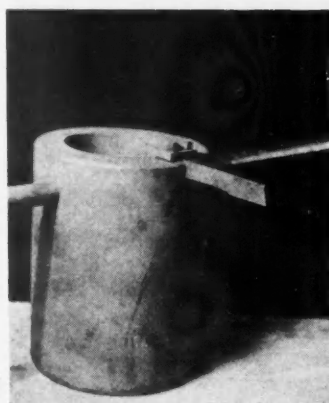
Fig. 38—Engine Leg Welding Jig

This jig is used to insure alignment when welding broken engine legs on Pierce-Arrow crankcases. It comprises a flat bar with a threaded post at each end. Each post carries two cones which are centered in the holes through which

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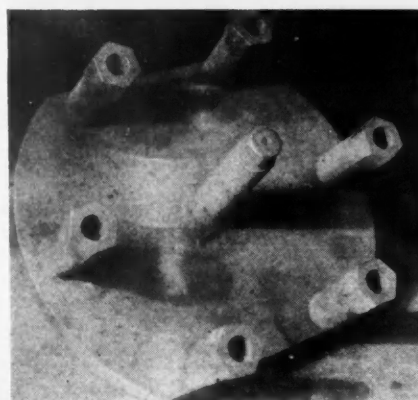
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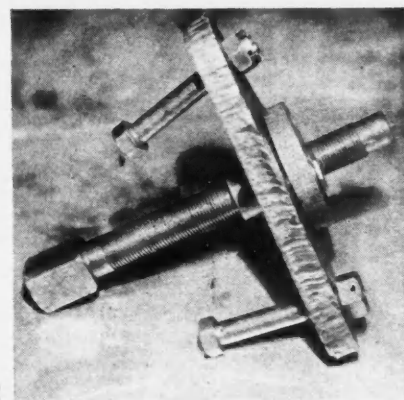
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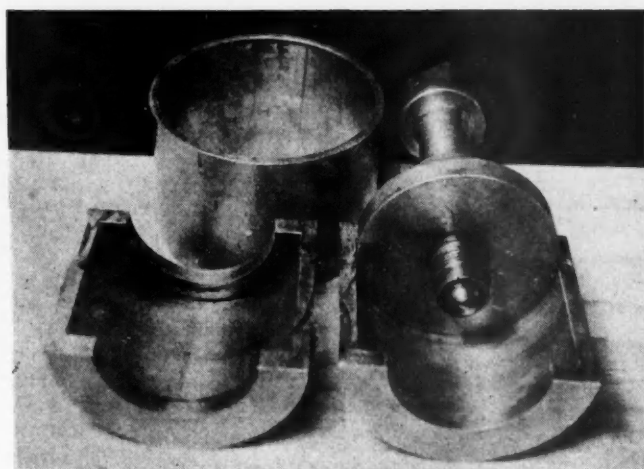
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IS THE SALESMAN'S PURSE IN NEED OF ADJUSTMENT?



Are Truck Salesmen Underpaid? Does Present System Attract Real Ability? Will Adjustment Increase Sales?

THE author is a sales manager with 16 years' experience in wholesale and retail selling of trucks. Salesmen now under him look upon him as a leader.

Here he discusses the problem of salesmen's compensation from the viewpoint of a sales manager who believes that if his employers wish him to fully realize his responsibilities to them, they must help him to realize his responsibilities to the salesmen under him.

Readers are invited to send their own views to the editor. To encourage frankness, names of discussers will be kept strictly confidential.

years' experience in retail selling know how highly essential correct mental attitude is to successful selling, and the best seasoned salesmen we have cannot go out day after day and do the job we expect of them and which they are capable of doing, if they are beset with financial worries and personal problems of a serious nature. Enthusiasm so highly necessary in sales work cannot be produced or maintained without a fair rate of compensation.

The sales executive is constantly striving for a larger percentage of the available volume and keeping sales costs down as low as possible at the same time. Effort in one direction is working against the other, for any gain in unit sales in a given territory must be accomplished at the expense of competition. Under some of the existing evils of the industry this means decrease in gross due to overallowance on the "trade-in" truck. And the decrease in available volume this year, compared with better years, has made competition generally more severe. Hence sales cost is much higher in proportion to dollar volume procured. To offset decreased volume, and decreased gross profits resulting from these over-allowances, drastic decreases have been effected in the salesman's compensation.

It is only common sense, of course, when a manufacturer experiences continued decreases in volume over a pro-

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SPEAKING frankly, this business of paying salesmen good salaries and small commissions when business is good, and then reverting to very small salaries or straight commission when business is poor, I believe should be adjusted. It must be if we are to retain the real producers and constantly keep this business of selling trucks inviting to the best class of sales material available.

After all, the salesman is the key-stone of the entire situation and if bad practices within our own industry are the real obstacles to reasonable profits let us not penalize the salesman to the point where we may greatly limit his efficiency.

Being in close touch with retail and wholesale problems right on the firing

line, I cannot help but feel that our present basis of compensation is encouraging a poor class of business, and resulting in personnel problems for our field managers which is distressing, to say the least, under present uncertain conditions. It is placing an added burden upon their shoulders which is not conducive to the cooperation and coordination so highly essential at all times.

Underpaid salesmen are subject to worries. They worry about home finances, family living conditions, surplus cash for that "rainy day," payments of mortgages or instalments, etc., and in time they suffer from injured pride and then often loss of self-respect.

Those of us who have had a few

RATING FORMULA TELLS WHAT A TRUCK NEEDS FOR A GIVEN JOB

Any One of the Four Factors, Torque, Speed, Weight or Ratio, Can Be Calculated If the Other Three Are Known.

By JAMES W. COTTRELL

FORMULAS upon which the S.A.E. performance factor is based may be used for calculating problems encountered in applying trucks and trailers to specific jobs. The performance factor formula itself may be transposed to determine any one factor, the others being known. A study of how this formula was derived shows that it may be, in fact has been, transposed.

The starting point is the Buckendale formula presented to readers of *COMMERCIAL CAR JOURNAL* in the July, 1931, issue. A slight modification of the expressions by the rating committee and an assumption that rolling friction is 1.5 per cent changed the formula to:

$$GVW \text{ or } GTW = \frac{T \times 12 \times e \times R}{r \left(\frac{G}{100} + RF \right)}$$

or, after multiplying,

$$GVW = \frac{675 D R}{r \left(\frac{100}{G} + 0.015 \right)}$$

Transposing terms to calculate grade, instead of gross weight, the formula becomes:

$$G = \frac{100 T \times 12 \times e \times R}{r \times GVW} - 100 RF$$

Substituting the figures agreed upon by the committee, that is, torque is equal to .625 times piston displacement and that mechanical efficiency is 90 per cent and multiplying the factors we have:

$$G = \frac{675 \times D \times R}{r \times GVW} - 1.5$$

This gives the grade directly in per cent, but does not give speed. The road-rolling resistance is shown by the final number 1.5. Putting rolling resistance and grade together on one side of the formula gives



$$\frac{675 \times D \times R}{r \times GVW} = G + 1.5$$

As previously explained in this series, speed is calculated by the formula:

$$MPH = \frac{RPM \times 60 \times 2 \pi r}{5280 \times 12 \times R}$$

$$\text{or } MPH = \frac{RPM \times r}{168 R}$$

Transposing these terms to bring gear reduction and rolling radius on the same side, opposite engine speed and vehicle speed, the equation is:

$$\frac{R}{r} = \frac{RPM}{168 MPH}$$

Again substituting terms we have:

$$\frac{675 \times D \times RPM}{168 MPH \times GVW} = G + 1.5$$

Two more mathematical acts will bring us to the performance factor formula. The first is to throw the speed factor on the right side of the formula and, figuring the factors with this in mind, we have:

$$\frac{4.01 \times D \times RPM}{GVW} = MPH \times (G + 1.5)$$

The right side of the equation combines speed, grade and rolling resistance and it is expressed as a single number, therefore is a numerical index of performance. By correcting for torque at maximum engine speed, instead of maximum torque irrespective of engine speed, the equation becomes

the performance factor formula given last month, that is:

$$PF = \frac{3.34 \times D \times RPM}{GVW}$$

These formulas may be used in two ways, first, to calculate the performance which may be expected of a given truck model, and, second, to figure the characteristics which must be incorporated in a truck to meet requirements of a given operation. The performance factor, which is included in the truck rating, can be applied by means of the table published last month without further calculations.

Use of the formulas may be illustrated by assuming a problem. The load to be carried is 6500 lb. and performance required is 30 m.p.h. and 4 per cent grade. A suitable chassis weighs 3500 lb., gross vehicle weight therefore is 10,000 lb. required; the piston displacement of engine and rear axle ratio to meet the conditions.

Looking up the performance factor table we find that 30 m.p.h. and 4.0 per cent grade calls for performance factor of 165. Without the table we can easily figure it because the performance factor equals miles per hour multiplied by grade plus 1.5. That is:

$$30 \times (4 + 1.5) = 165.$$

Let us assume that the engine in a truck we are considering is rated at 2500 r.p.m. How can we figure piston displacement? It can be calculated from the torque formula, but a simpler method is to use the performance factor formula. Substituting known figures in this formula we have:

$$165 = \frac{3.34 \times D \times 2500}{10,000}$$

Completing the calculation gives 197 cu. in. displacement. The engine of the imaginary chassis has 200 cu. in. displacement and therefore meets the requirements.

We have fixed both engine speed and vehicle speed in our calculations and therefore must use a rear axle ratio which will apply the engine torque to meet the speed and hill-climbing ability agreed upon.

There is a formula to give us engine speed when axle reduction, tire size and vehicle speed are known. It is:

$$RPM = \frac{MPH \times R \times 168}{r}$$

To calculate R directly the formula is transposed to put R, gear ratio, on the left, thus:

$$R = \frac{RPM \times r}{MPH \times 168}$$

Assuming that 32 × 6-in. tires are used the rolling radius will be 16.10 in. and substituting known figures in the formula including 30 m.p.h. we have:

$$R = \frac{2500 \times 16.1}{30 \times 168} = 7.9$$

This is the rear axle ratio which will provide 30 m.p.h. and hill-climbing ability of a 4 per cent grade with an engine of 200 cu. in. displacement. But the engine will be running at its recommended maximum speed of 2500 r.p.m. and in ordinary service operators do not wish to run an engine at full speed for a vehicle speed of only 30 m.p.h. If a maximum vehicle speed of 45 m.p.h. at maximum engine speed is satisfactory the gear ratio required will be 5.32. The figures are:

$$R = \frac{2500 \times 16.1}{45 \times 168} = 5.32$$

With this gear ratio in use the 4 per cent grade would be climbed with the transmission in gear, perhaps third speed in a four-speed gearset. Of course the figures vary with each job and those chosen for illustration are not of any particular truck model or operation. They are simply used as examples.

Rolling radius of tires is an essential factor in all of these performance formulas and it is one of the first figures to be determined. Just as soon as the vehicle gross weight of a truck recommended for a given operation is fixed, the very next step is to choose the tire size suitable for the load and operating conditions. When the tire is selected the rolling radius is taken from a table. Rolling radius is tied in with gear ratio because the radius determines how many revolutions the tire makes per mile. With a given radius of tire it is then the gear ratio which determines how many revolutions the engine makes for one revolution of the rear wheel and, therefore, how many revolutions the engine makes per mile.

Abbreviations used in formulas

GVW=Gross vehicle weight to nearest 100 lb. This weight includes chassis, body and payload and is measured at the tires on the ground.

GTW=Gross train weight in pounds. This weight includes chassis, body and payload of truck or tractor and trailers, measured at the tires on the ground.

D=Cubic inch displacement of engine.

T=Engine torque, in pounds-feet, available for vehicle propulsion. A recommended basis for purposes of comparison is 0.625 lb.-ft. torque per cubic inch displacement. This is an average value for average conditions and may vary slightly from actual torque developed. In the performance factor formula, due to the fact that the torque used is the torque at the maximum rated speed, an additional factor of .83 must be used so that the factor becomes .625 × .83 or .519. Therefore,

R=Axle gear reduction.

r=Rolling radius of loaded driving tires in inches.

RF=Road-rolling resistance factor in pounds per pound of GVW or GTW. A recommended basis for purposes of comparison is 0.015, an average value.

G=Grade in per cent.

e=Efficiency from engine to tires in direct drive. A recommended average is 0.90 in direct gear and 0.80 through transmission gears.

BHP=Brake horsepower available for propulsion of vehicle or train.

MPH=Vehicle speed in miles per hour.

RPM=Engine speed in revolutions per minute in direct gear.

PF=Performance factor.

The President's Page

CONTINUED FROM PAGE 9

of the motor vehicle, but the yield from motor vehicle revenues as well.

It is not the contention of the American Automobile Association that the railroads are not paying enough taxes. Every industry today is feeling the weight of the tax load, and the railroads are feeling it in common with others. Our contention merely is that highway transport is paying an enormous tax bill and that the propaganda of another transportation agency, namely, the railroads, encouraging a heavier tax on highway users, is indefensible.

The American Automobile Association has for years favored adequate regulation of highway common carriers by the states and, where interstate bus operations are involved, by the Federal Government. There is a great difference, however, between such regulation and the strangulation through the use of the taxing weapon which the railroads are encouraging throughout the country today.

The states have ample powers to make such regulations as would assure maximum safety for passenger cars using the highways along with heavy commercial vehicles. The question of length and width of these vehicles, including the truck and trailer combination, is certainly one deserving of study. However, it should not be approached in the punitive spirit that the railroads are fostering today.

It is to be hoped that the legislatures will insist on facts and not be led to hasty action by the shock battalions of railroad employees who have been so carefully coached that they speak the same lines with the same pathos and the same dramatic appeal at all the crossroads and way stations of America. They are careful not to point out that there are 50,000 communities in the United States that have no rail facilities and are wholly dependent on highway transport.

When it comes to the taxation of buses and trucks, the American Automobile Association, which primarily speaks for the passenger car owners, believe that commercial motor vehicles should pay a share of the road bill commensurate with their use of the road and the differential, if any, between the cost of arteries adequate for passenger car traffic and arteries necessary for heavy commercial traffic. This, however, is a matter for technical study. The commercial vehicle operators claim that they are now paying their share.

Pending definite conclusions based on expert studies, it is unscientific to resort to indiscriminate use of taxation as a means of bringing about the equality of opportunity on which the railroads lay so much stress and to which they are entitled.



Hydraulic-minded

THERE is a clearly defined group of people, owners and operators of automotive vehicles, who may fairly be called the "Hydraulic Market."

These numerous people have acquired, by personal experience, a conviction that Lockheed Hydraulic Brakes are the ultimate in brakes—as to actual stopping efficiency and as to satisfaction delivered.

They will always think so—as will a corresponding group of makers of cars, trucks, buses; who recognize the existence of that market; and see the economy of short-cutting the selling problem by giving these Hydraulic-minded customers what they want.

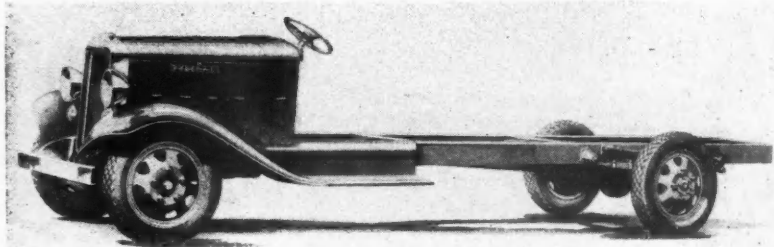
HYDRAULIC BRAKE COMPANY

DETROIT, MICHIGAN, U. S. A.

LOCKHEED HYDRAULIC

Four BRAKES *Wheel*

FEDERAL CREATES A SMART STYLE FOR THREE NEW MODELS



Federal Model E-4, 1 1/2 Tonner

LONG straight hoods, with door type ventilating louvers, wide, deep, somewhat sloping and V-shaped radiator shells with grille type front, fenders with deeper crowns and appearing to be of one piece manufacture, splash pans which effectively conceal the front of the chassis—these details lend a distinctly modern appearance to three new models introduced by the Federal Motor Truck Co. for 1933.

These radiator shells are as deep as on any passenger car, with same pleasing effect, and the grille front conceals the fender and headlamp tie-bar in the modern manner. Mounted below each chrome-plated headlight is a diaphragm type horn. Hood louver doors have chrome-plated wind-splits.

For the cabs, there are three cowl ventilators, one on top and one on either side. Instrument panels are simple but attractive, and include a gas gage and temperature indicator in addition to the usual instruments.

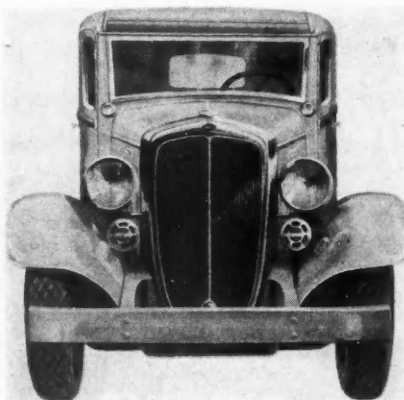
The three new Federal models are respectively, the E-4, a 1 1/2-ton chassis on wheelbases of 130, 142, 154, and 166 in., the A-7 with a rating of 2 1/2 to 3 tons and gross of 15,000 lbs., and the A-8 with a gross rating of 18,000 lbs. and tonnage capacity of 3-3 1/2 tons. The latter two are available in eight wheelbases each, ranging from 153 to 237 in.

While the A-7 and A-8 are completely new models, the E-4 is in some respects, mechanically a development from the former E-3 series. It is available with either the four or six-cylinder Continental engines found in the previous D-3 and E-3 models. Three point suspension, centrifugal water pump, oil filter and camshaft driven fuel pump are found on both engines. The six has Invar strut aluminum alloy pistons.

Standard tires on both models are 6.00/20 six-ply balloons front and 32 x 6 in. high pressure rears, all on ventilated disc wheels of the demountable type, with dual wheels available at extra cost. Other noteworthy features of the E-4 are an

11 in. heavy duty clutch, 4-speed transmission, full floating rear axle and 6 x 2 1/4 x 1/4 in. frame side rails. Standard chassis weight is 3225 lbs.

In the A-7 and A-8 the engines are Waukeshas, that on the smaller model being the 6MS series, with



Federal's snappy front end

the 6MK on the A-8. Both have a stroke of 4 1/4 in., with bores of 2 1/4 and 4 1/2 in. respectively. Built-in fly-ball type governors are found on these engines.

Clutches are single plate, with diameters respectively of 12 and 13 in. Mounted in unit with the engine is a five-speed Clark transmission on

both chassis. This transmission has helical constant mesh gears for countershaft drive and fourth speed operation, for quietness. Direct is in fifth. By the use of a five-speed transmission, of course, steps between gears have been materially reduced, while the dog-clutch shift between direct and fourth speeds facilitates handling by the operator for rapid shifting, when desired.

Both the A-7 and A-8 have Spicer universal joints with roller bearings of the needle type.

Four wheel hydraulic brakes with B-K vacuum booster brakes are found on the A-7 and A-8. Front drums are 16 x 2 1/2 in. Rear drums on the A-7 also are 16 in. with 3 1/2 in. lining, while 17 1/4 in. drums with 4-in. lining are found on the A-8. Emergency brakes are of the two-shoe ventilated disc type.

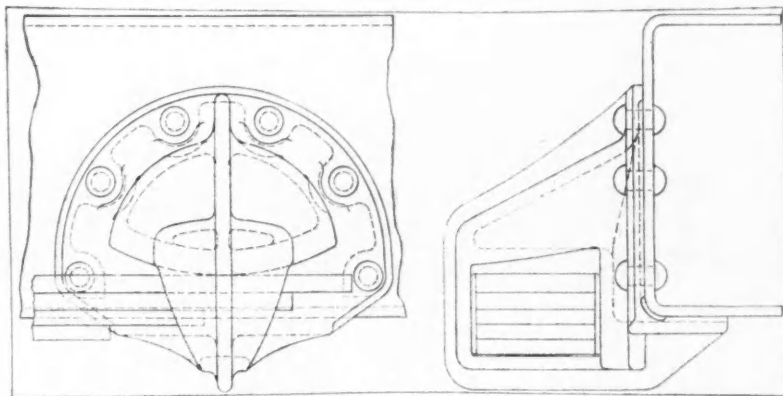
Rear axles on the A-7 are full floating spiral bevel Clarks with Timken on the A-8, also full floating. Front axles, of Clark manufacture on all models, are wider than on former Federal models, the increased tread being used for shorter turning radius.

Front springs are shackled at the front. Rear springs are also shackled at the front for Hotchkiss drive, but rear ends of these springs are of the floating contact type, eliminating shackles, pins or bushings, and need for lubrication. The top leaf of these chrome manganese springs contacts a radius in a frame bracket, and under load the effective length of the spring is shortened 2 in. from no-load to full-load condition.

Chassis frames are of the fish-belly type with 10 in. depth maximum section tapering toward front and rear. Side rail stock is 1/4 in. thick.

Tires on the A-7 are 8.25/20 in. balloons all around, mounted on 20 x 7 in. cast spoke type wheels. Wheels 20 x 8 in. of the same type carry the 9.00/20 in. balloons standard on the A-8.

Rear ends of rear spring slide



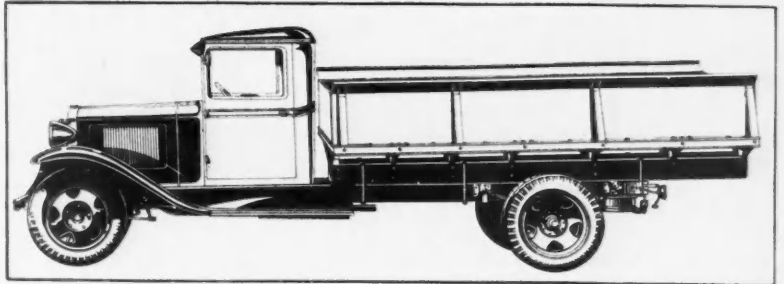
CHEVROLET JACKS UP POWER AND DROPS PRICE ON '33 LINE

FOR 1933 the Chevrolet commercial line consists of three models as formerly, a light delivery of 108 9/16-in. wheelbase, and the 131 and 157-in. wheelbase trucks, all at lower prices than last year. In the light delivery models axles, clutch, steering mechanism and wheels are interchangeable with passenger car units. Engines, however, are the same as those used in the heavy-duty trucks. Transmission in the light delivery is the same as in the passenger cars, including the synchro-mesh design, but omitting the free-wheeling unit. Sheet metal parts and radiator conform to those in the truck line. Frames are a modification of 1932 passenger frame.

The 131-in. wheelbase truck is supplied with either single or dual wheel equipment. It has a frame 6½ in. deep, four-speed transmission, 10-in. clutch, heavy-duty front and rear axles, and a special truck engine. It is rated as formerly, 1½ tons, having a gross allowable weight of 7500 lb. with single and 8300 lb. with duals.

The 157-in. wheelbase is rated at 7900 lb. gross with single and 8300 with dual wheels. Except for the frame it uses the same major units as the 137-in. model.

The engine which powers the entire Chevrolet commercial line incorporates all the developments which have been added to the 1933 passenger car engine. Horsepower output has been increased to 56 at 2750 r.p.m., with the increase relatively greater at low than high engine speeds; 51 hp. is developed at 2000 r.p.m., and torque peak in the relatively flat torque curve is 146 lb.-ft. at 1000 r.p.m. Engine mounting in the long and short truck line retains the metal supports at the rear, but at the front the spring mounting has been replaced by the same rubber unit now used on the light delivery.



Chevrolet 1½-ton with express body

Prices of Chevrolet 1933 Line

	½ ton	1½ ton	1½ ton
Chassis delivery	137 in.	157 in.	
1933 ...	\$330	\$480	\$510
1932 ...	355	520	575

Delivery chassis with bodies; sedan delivery \$545, standard panel \$530, special panel \$545, canopy \$525, screen side canopy \$544, closed cab pick up \$440, closed cab canopy top \$470.

Truck chassis 131 in. wheelbase with bodies; cab \$570, standard panel \$715, van panel \$870, canopy \$710, screen side canopy \$732, platform \$625, stake \$655, stake express \$665, open express \$650, high and wide express \$660, high rack \$670, special stake \$640.

Truck chassis 157 in. wheelbase with bodies; cab \$600, van panel \$950, platform \$670, stake \$715, stake express \$725, high and wide express \$705, high rack \$740, combination farm \$725.

Special equipment for 1½ ton models, dual wheels \$25.

Racks for combination farm model \$60, tip top \$25.

Clutch and transmission improvements are minor in character. Universal joints, however, have been redesigned to provide greater strength and smoother operation. The joints on both lines of trucks are identical except for the square and splined holes to fit the various shafts to which they

assemble. The new joint is of the spider type with four cylindrical bearings. A flat machined on each of the trunnions provides for entrance of lubricant. Hardened steel bearings are assembled from the sides of the joint and retained by spring steel snap rings. These bearings are of the cylindrical type.

Fuel tanks, under the seat, have been increased to 15-gal. capacity. In both trucks the steering ratio has been increased to 14:1.

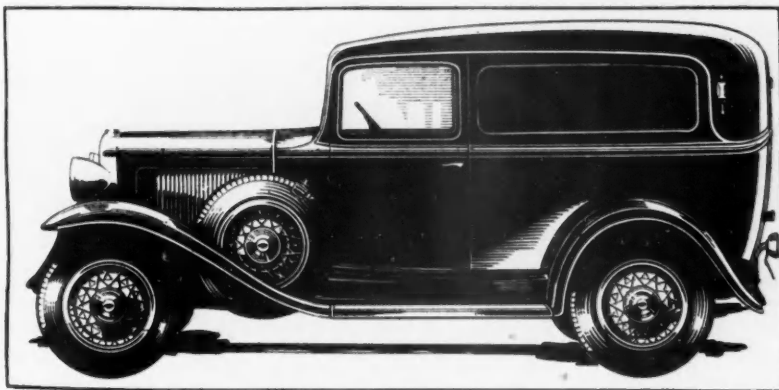
Frame section in the short wheelbase truck has been increased in all dimensions. Maximum depth is now 6½ in., with 2¾-in. flanges, and using 3/16-in. stock.

Rounded edge leaves are found in the springs of the short wheelbase truck to decrease wear. On both Rear axles have been redesigned for greater strength, particularly at points of maximum stress. There is a new straddle mounted drive pinion. This involves a change in bearing sizes, the front pinion shaft bearing being larger and the rear smaller than formerly. Ring gears are larger in diameter. Differential is of the four-pinion type.

The torque tube is larger in diameter at the rear end, as is the propeller shaft. An optional axle ratio of 6.17:1 is available on the short wheelbase truck. Front brake drums have been increased in diameter to 12 in. as on the light delivery and passenger car, and provided with wider lining.

While standard wheel and tire equipment on the trucks remains unchanged, more options are available for varying conditions of service. All optional tires fit the 20 x 5-in. standard rims. Available at no additional cost are 6.00/20-in. 6-ply balloons. Available at extra cost are 32 x 6 8-ply tires, and 6.50/20 6-ply balloons, as well as 7.00/20 8-ply balloons. With the 6.50 and 7.00-in. balloons special spacers are provided between the dual rear wheels to prevent side-wall rubbing.

Chevrolet delivery chassis with panel body



DODGE — SHULER — ROCKNE

Dodge Sedan Delivery Has Passenger Lines

CARRYING out the body lines of its new passenger cars in its new Sedan Delivery, Dodge Brothers has built striking appearance in this commercial chassis. It is mounted on the new Dodge Brothers six-cylinder chassis. Sloping V-shaped radiator front, with chrome-plated shell; fenders which conceal the chassis front and rear; chrome-plated windshield frames of the sloping type, with rounded front headers and hoods which extend almost to the base of the windshield, concealing the usual cowl, are among the appearance details of this new light delivery unit.

Cowls are stamped of a single piece of steel, making possible rigid and yet narrow posts for maximum vision for the driver. The dash is heavily ribbed and insulated against engine noises and heat. A hand operated cowl ventilator is located just back of the hood ledge. Door pillars are an integral part of the body sides, being flash-welded to the cowl and the rear end of the side panels. The one-piece steel body sides are placed over hardwood posts, lined with insulating material and covered with plywood to make them soundproof.

There are no separate roof side panels, these being formed integral with the body sides and curving gracefully over into the top. An inset panel, which adds to the attractiveness of the model, extends from front door to rear of body. Passenger car appearance characterizes the front doors, which are of all-steel construction with large windows hand-crank operated.

Easy access to the load compartment is achieved by use of a full size all-steel rear door. It is fitted with a large rectangular glass window. The roof is of the set-in type similar to that used on the latest Dodge passenger cars. The entire body, including the cowl, is rustproofed before lacquering by a special process known as Parkeliting, which also forms a bond for the primer paint coat.

Inside, a rubber matting, $\frac{1}{8}$ -in. thick, covers the entire heavy plywood

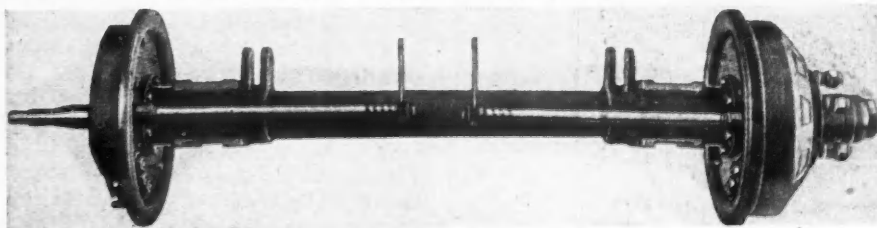
floor. The floor itself is laid in one piece over cross sills, bolted to the bottom of the sides. Body interior, including the rear door, is finished in plywood veneered to a mahogany grained appearance. Loading space is illuminated by a dome light in the center of the body, which can be lit from two switches—one integral with the light, the other at the rear of the left door. The driver's seat has a steel frame with Pullman type springs, heavily padded and is adjustable. A folding companion seat is provided to the right, hinged to the floor. Front compartment doors under the rubber matting are heavily padded for heat and noise insulation.

Steering columns have been made adjustable. Brake and gear shift levers are placed well forward to provide easy access to the seat from either side. Rubber pads are provided on the pedals as well as the accelerator and starter. Instruments are carried in an attractive and indirectly illuminated panel.

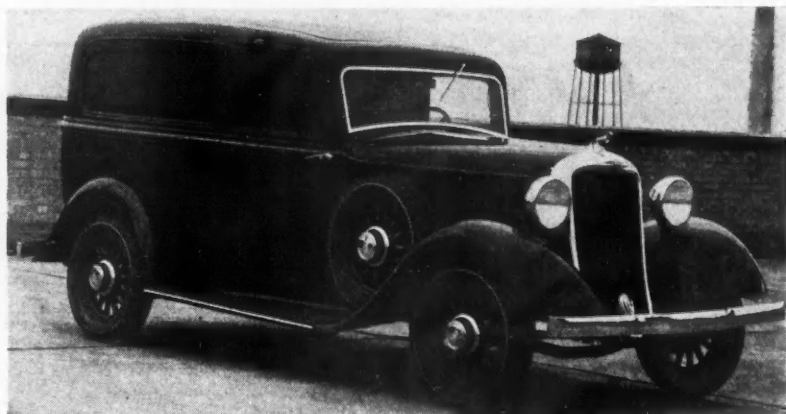
Shuler Adds Tubular Axle to Trailer Line

THE Shuler Axle Co., Inc., Louisville, Ky., has added a tubular axle to its line of square axles for trailers. The square-section trailer axles will be continued, the tubular axle being add-

Shuler tubular axles are made from one-piece seamless tubing



January, 1933



Passenger car lines give new Dodge delivery unit striking appearance

ed to meet the demand for this type of design.

The tubular axle is made from one piece seamless tubing, the spindle ends being formed in the rolling operation. Tubes are heat-treated and can be furnished with or without camber as specified. The entire assembly is free from welds. Hubs and brake equipment are interchangeable with similar parts on regular axle equipment.

Delivery Unit of New Rockne Lists at \$615

SHOW time announcements by Studebaker include a new name in the commercial field, the new Rockne retail delivery unit, a de luxe style panel job, listing at \$615. The engine is a six $3\frac{1}{2}$ x $4\frac{1}{2}$ in., of 190-in. displacement. A distinctive feature of the body is a two-level roof, the roof of the loading compartment being higher than that over the driver's space. Complete description of the unit will be available within the near future.

Truck Legislation Shoots Up Cost of Feeding the Public

CONTINUED FROM PAGE 17

four cents per cwt. additional cost to our transportation bill.

There is a place for all forms of transportation in a distribution system such as ours. The imposing of restrictive legislation on motor trucks will increase our cost of distribution. Some form of regulation is necessary, but it must be fair and based on scientific information. It must be uniform in all states to permit free and easy flow of trade. Restrictive legislation will not prevent the most economical form of transportation from being used for each distribution problem.

The Commercial Car Journal

“Money players...”

TIMKEN

TUBULAR TRAILER AXLES

Like the ball-player and football star that outdo themselves in crises Timken Trailer Axles *prove* their extra worth when you figure actual dollars and cents, in costs and profits.

The tubular section of the Timken Trailer Axle—

- * reduces chassis weight, without sacrificing carrying capacity.
- * weighs much less than any solid beam of equal capacity.
- * resists deflection under radial or torsional loads.

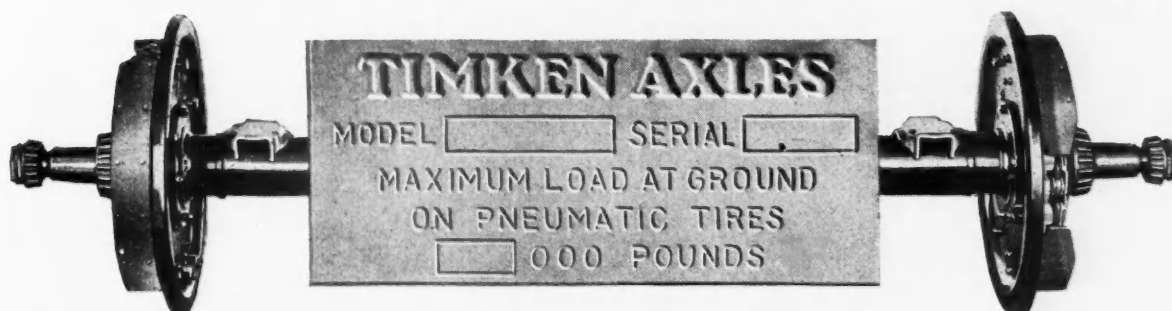
What's the answer? Timken Trailer

Axles minimize tire wear; *solve* the trailer-brake problem; cut operating costs.

These are facts, easily provable. The best way is prove them for yourself: to *your own* profit.

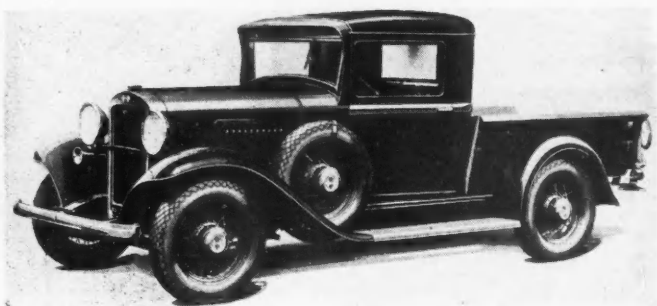
On new trailers, specify Timken Tubulars. To modernize brakeless trailers, and to correct excessive tire wear, equip with Timken Tubulars.

Interesting booklets covering all phases of vital trailer-operation problem will be sent to you on request.

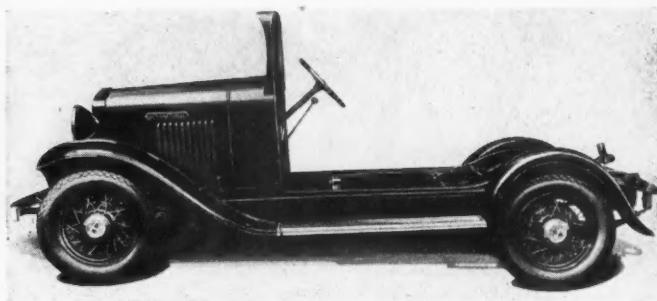


THE TIMKEN-DETROIT AXLE COMPANY, DETROIT, MICHIGAN





Cab and pick-up body on Model D-1



Chassis includes cowl and windshield support

I. H. C. CRASHES LIGHT DELIVERY FIELD WITH \$360 HALF-TONNER

STARTING of production of the new International Model D-1 a ½-ton six-cylinder truck marks the entrance of the company into the light delivery field and in the highly competitive low-price bracket. The chassis with standard equipment lists at \$360, which is the lowest price ever quoted on an International chassis, and is but \$30 more than the 1933 Chevrolet and \$40 more than the Ford delivery chassis.

Model D-1 is being built by the Willys-Overland Co. to International Harvester Co. specifications. First units came off the assembly line late in December, and first schedules call for production of 100 units daily, according to L. A. Miller, president of Willys-Overland.

The chassis is rated to carry ½-ton, and chassis carrying capacity, comprising cab, body, equipment and payload, is specified at 2000 lb. The unit is powered by a six-cylinder 3 5/16 x 4 1/8-in. engine with 213 cu. in. displacement. A 9-in. single plate clutch, three-speed unit mounted transmission, and spiral bevel gear semi-floating rear axle make up the drive line. Five 40-spoke 18-in. wire wheels and left front fender well and tire carrier are standard equipment. Coupe type cab and pick-up body or de luxe panel body are available at extra cost.

Brake horsepower of the engine is 70 at 3400 r.p.m., and maximum torque of 138-lb. ft. is developed at 1200 r.p.m. The crankshaft is carried in four steel-backed interchangeable type main bearings. Tool seat valve inserts are used for the exhaust valves. Lubrication is force feed to main, connecting rod and camshaft bearings and timing chain. The downdraft carburetor is fitted with an air cleaner.

Service brakes are of 4-wheel two-shoe self-energizing type controlled by cable. Hand lever likewise applies

Specifications of Model D-1

Rated capacity ½-ton
Price\$360
Engine6 cyl.
Cylinders3 5/16 x 4 1/8 in.
Displacement .213 cu. in.
NACC rating .26.3 hp.
Brake hp.70 @ 3400 r.p.m.
Torque138 lb.-ft. @ 1200
Clutch9 in. single plate
Transmission .3 speeds
Rear axleBevel-semi-float.
Brakes4-wheel mech.
Tires5.25/18 balloon
WheelsFive, wire type
BodiesCab, pick-up,
de luxe panel

brakes on four wheels. Tires are 5.25/18 balloons on both front and rear wheels.

The frame includes a double drop, and is 43 1/4 in. wide at the rear. Channels are 5 1/4 x 2 1/4 x 9/64 in. and

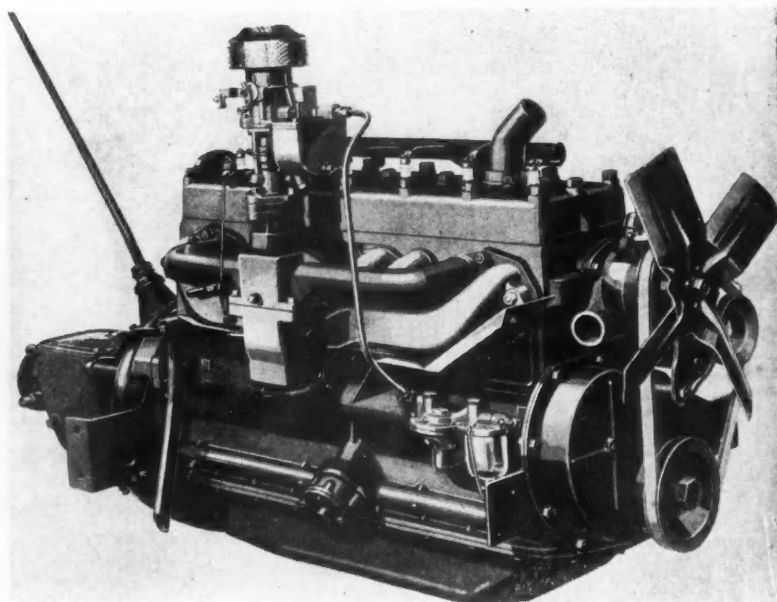
are joined by five cross-members.

The pick-up body, of all-steel construction, has loading space 66 x 46 1/4 in., with side panels 11 in. high with 6-in. flareboards. The body has four stake pockets, and the end gate chains are covered.

Load space dimensions of the de luxe panel body measure 72 in. long, 46 1/4 in. wide and 47 in. high. It has full panels of three-ply fir veneer in natural finish. There is a single adjustable seat. Slanting windshield, rear vision mirror and dome light are included.

Standard equipment includes cowl, dash and windshield supports, front and rear fenders, running boards and the usual instruments. Special equipment at additional cost includes: front bumper, two-way shock absorbers, and the cab and bodies previously mentioned.

The D-1 engine is a 3 5/16 x 4 1/8 in. six





COMMERCIAL CAR JOURNAL



NEWS



Highway Interests Mobilize

More than twenty-three leading national organizations interested in highway and building activities have joined forces in the Highway and Building Congress to be held at Detroit during the week of January 16, 1933. Plans will be made to forestall drastic curtailment of highway development and motor transportation growth threatened by proposals to divert motor vehicle and gasoline tax revenues to purposes other than highway construction and maintenance. The highway sessions of the Congress will be held at the Masonic Temple, January 19 and the building sessions

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Tax Exemption Rulings

Several important rulings have recently been announced by the Tax Department with respect to the tax on automobile parts and accessories. For example, wrecking cranes sold for mounting on trucks, towing cradles used in connection with service trucks, re boring machines, valve refacing machines, valve regrinders, air compressors and paint spraying equipment are not considered as parts or accessories and are not subject to tax.

Lee Tops A. B. L. A.

Robert Lee, vice-president, Thermoid Rubber Co., was elected president of the Asbestos Brake Lining Association. G. W. Marshall, Jr., assistant sales manager, U. S. Asbestos, was elected first vice-president; M. T. Rogers, vice-president, Multibestos Co., second vice-president; and W. J. Parker, commissioner.

Lycoming V-12 Truck Engine

The Lycoming Mfg. Co. exhibited at the New York Show its new V-type, 12-cylinder truck engine. It has a 3½-in. bore and 4¼-in. stroke giving a displacement of 492 cu. in. and developing 160 hp. at governed speed of 2800 r.p.m. with torque of 350 lb. ft. at 1200 r.p.m.

Handy Governor Manual

Handy Governor Corp. has issued a new manual of governor specifications covering the entire field of truck transportation which is available to any fleet owner, truck dealer or service organization.

Cleveland's Truck Trio

Manufacturing, engineering and sales departments of the Indiana Motors Corp. will remove from Marion, Ind., to Cleveland, Ohio, immediately, according to A. E. Bean, president, White Motor Company. This brings

to the White factory the manufacture and assembly of White, Pierce-Arrow and Indiana truck lines. The removal of the Pierce-Arrow truck line from Buffalo, N. Y., to Cleveland is now practically complete. Studebaker trucks will continue to be built at South Bend and Rockne commercial cars at Detroit.

Doling Heads N. Y. Autocar

Chas. E. Doling, a vice-president of the Autocar Sales & Service Co., has been transferred as manager from the Philadelphia branch to the Metropolitan New York area. Auto-car executives felt that the increasing volume of business from this section warranted this transfer of one of its most capable men. Edward F. Coogan, also a vice-president of the subsidiary unit of the Autocar Company, leaves Boston to take Mr. Doling's place in Philadelphia. H. R. Gary has been elected a vice-president and transferred to the Boston branch managership, succeeding Mr. Coogan.

Depression Takes an Upper-cut

November sales of the Diamond T Motor Car Co. showed a gain of more than thirty per cent for the corresponding month of 1931. In fact, more trucks were sold in November, 1932, than in any previous November in the 25-year history of the company.

November Truck Sales

November sales of trucks made in the United States, according to the Bureau of Census, were 12,024 compared with 13,595 in October; 19,683 in November, 1931, and 35,613 in 1930.

Preliminary 1932 Truck Facts

During 1932 237,500 trucks having a wholesale valuation of \$138,000,000 were produced in the United States and Canada, according to preliminary facts and figures released by the National Automobile Chamber of Commerce. The truck registration was 3,231,000 of which 880,000 were on farms. Of the total trucks registered

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These Men Want Jobs

Osborn, John D. (39), 91 Linden Avenue, Irvington, N. J. Nineteen years' experience in trucking and express work. Thoroughly familiar with New Jersey and New York City. Was sheet writer, chauffeur and foreman with one concern for 17 years and another for two. Desires any position in line with experience. Will go anywhere.

A-14 (40), 23 years' automotive experience. Grounded in modern methods of budgetary control, market research and sales analysis. Knows branch, distributor and dealer method. Able to train men, conduct service sales meetings, line up service sales territories, promote service sales contests. Traveled extensively in eastern territory. Available now. Location immaterial.

N. Y. Truck Groups Combine

More than 2000 individuals and companies operating commercial vehicles in New York State have been brought together in a single organization through the amalgamation of the Motor Truck Association of America and the Empire State Motor Truck Owners Association. The combined group will be known as the New York State Motor Truck Association, Inc., with headquarters at 1440 Broadway, New York and 184 State Street, Albany. Henry V. Mittleworth of the Consolidated Gas Company has been elected president. The executive department will be under the direction of Theodore D. Pratt, managing director, and Louis G. Stapley, manager.

Frank A. Miller With U. S. Asbestos

To more fully capitalize the potentialities of the commercial transportation field the United States Asbestos Division of Raybestos-Manhattan, Inc., has formed a Commercial Transportation Sales Division. Its manager is Frank A. Miller, formerly with the Stromberg Carburetor Co. in a sales and advertising capacity, and later

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Jersey Direction Indicators Enjoined

An order restraining Harold G. Hoffman, Commissioner of Motor Vehicles of New Jersey, from enforcing the law requiring trucks and cars to have direction indicating signal devices has been issued. Indications are that the state will repeal the act.

Kentucky Truck Law Upheld

Kentucky regulatory truck law which fixes maximum load at 18,000 lb., height 11½ ft., width 9 in., and length 26½ ft. has been upheld by the State Court of Appeals as constitutional.

Dahl an N. A. C. C. Director

T. R. Dahl, vice-president, White Motor Co., has been elected a director of the N.A.C.C. Mr. Dahl is also a member of the Chamber's Truck Committee.

White Has Good Month

More White trucks were sold during December than in any month since last June, according to an announcement made by J. M. Cleary, president of the White Company.

Puts on 13,734 Workers

General Motors Corp. announce that 13,734 employees have been placed on the payroll in the past three months.

Is the Salesman's Purse In Need of Adjustment?

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longed period that sales organizations will be reduced in size and compensation reduced somewhat, but I believe you will agree that the salesman is not altogether responsible for the loss in volume, and it would of course be unfair to blame him for an accepted evil like "over-allowance." Hence in the face of these existing conditions, I believe the salesman has received more than his rightful share of "salary cutting." In fact, I believe the cuts have been too drastic, and that they are creating a rather destructive effect upon the morale of our men in the field. It is, therefore, vitally important that the industry formulate a plan of compensation for salesmen and sales managers that is more commensurate with the experience and ability necessary for sales success in an unusual and highly competitive field.

The straight commission basis, which is meeting with favorable consideration by many factory executives and a few branch managers, is not the solution to our sales problem under present conditions by a wide margin. There are too many factors working against it, and the time between orders is too great.

The commission form of compensation originated with companies merchandising products that enjoyed a brisk turnover, when demand slightly exceeded production, and when prices and terms were highly stabilized. Straight commission salesmen even in those days would lag several days after a good profitable sale, a very dangerous habit for a salesman to form but one nevertheless difficult to control. Then, too, companies working on straight commission basis frequently have to advance money to their salesmen at time during business recession, often resulting disastrously for many good men who find themselves in debt up to their neck to the concern they work for. Again we frequently experience another bad reaction to sales psychology when these advances are deducted from commission earned and the adjustment is not handled diplomatically. The straight commission salesman may feel that he is his own boss and therefore frequently he is not receptive to constructive advice or may not carry out certain instructions which may be highly important to the company because he feels he is not being paid for it. In other words, sales direction is considerably limited.

The salesman working on a straight salary on the other hand may not strive to produce more than he is being paid for, and the really ambitious salesman highly resents the fact he cannot earn more for doing the exceptional job over a long period of time, which soon dull enthusiasm and initiative. Then there is always the

danger with the "straight salary" man to direct his thoughts and actions toward justifying his salary only, thereby limiting his capacity to the amount of his salary.

I have heard some tight-fisted executives say that only salesmen who pay their way should be paid. And I agree, but how much should the salesman be paid? It has also been rightfully said that the earning power of the salesman is unlimited if he can sell, which is quite true. But on the other hand, what are the average monthly earnings per salesman in any given truck organization today?

Regardless of some opinions to the contrary, we must, I feel sure, offer sufficient incentive to our salesmen to insure consistent hard effort. I believe the combination of salary and commission comes very close to the ideal method of compensation, but the salary should be sufficient to meet the ordinary necessities of life, and commissions of fair percentage that offer the chances of real income to the salesman procuring satisfactory volume. In other words, the opportunity of commission earnings should be sufficient to insure the better than average salesman, to have money in the bank, investments in securities, protection against emergencies, slumps and incapacities. This form of compensation encourages extra effort, longer hours and stimulates resourcefulness. It forms the added incentive to make that extra call or two, which means more business.

The rate of commission to be paid, of course, depends largely upon gross profit possibilities together with the amount of salary paid per month. Commissions should be based on a sliding scale according to the quality of the order, encouraging substantial cash down payments and limited terms, as much as possible, keeping in mind however that in the majority of cases the salesman has not a very strong control of this situation, that is above averages.

I do not know of any sales job today requiring the varied knowledge and experience necessary in successful truck selling, in fact aside from being a salesman in every sense of the word, he must know his own product thoroughly and his competitors' products as well. He must be a well posted transportation man with a viewpoint from the operator's side. He should be fairly well grounded in mechanics generally and have a thorough understanding concerning general chassis design, load balance, truck ability, tires and tire capacities, brakes and braking ability, cab and body construction, refrigeration, dumping mechanism, winch and capstan performance, gear ratios and its relations, together with a good knowledge of operating and maintenance costs.

In fact, the industry is becoming more exacting every day in its demands upon "selling ability" and "knowledge of truck transportation" and all of its ramifications.

Therefore, I believe you will agree with me that this business of merchandising motor trucks has indeed become a highly specialized sales job requiring the best ability we can procure and that the importance of fairly compensating these demands is quite evident.

A good salesman is never a liability and the sales job we have ahead of us right now requires real man-power.

To a great extent in the eyes of the buyer a company is no bigger than the salesman representing it, and to insure proper representation compensation must be liberal enough to offer real opportunities.

N.Y.C. Shop Sweeps Out Wasteful Repair Practices

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engine mounting bolts ordinarily extend. Distance from center to center of posts is 30 3/8 in.

Fig. 39—Rear Axle Thread Chaser

Broken or crossed threads on rear axle tubes are cleaned up by a cylindrical type thread chaser. It comprises a relatively long cylinder with two handles, removable like those in a thread die. The thread cutter is inserted in a slot near the top and fastened by a small cross clamp.

Fig. 40—Wiper Rings

A stepped ring holder is used to support piston rings while a cut is made in the bottom edge to provide a wiping action to control oil pumping. After the ring is in place, it is held in position by the removable cover.

Fig. 41—Wheel Puller

A heavy duty wheel puller has threads which engage six wheel studs instead of the hub thread. This puller will remove wheels which will not respond to ordinary pullers and its use prevents damage to hub threads.

Fig. 42—Clutch Drive Flange

A loose center section features this clutch drive flange puller. After it is fastened in place and pressure applied, a limited amount of movement of the threaded center section can take place within the steel plate. This imposes a severe shock on the shaft during hammering and loosens the flange.

Fig. 43—Crankshaft Gear Puller

A heavy duty type crankshaft gear puller is used to remove the combined starting crank dog and crankshaft gear on certain engines. It is powerful enough to shear the pin which prevents the gear from moving lengthwise of the shaft. Drilling the pin out, which is the usual procedure, sometimes takes as much as two hours.

Fig. 44—Universal Joint Flange Puller

A discarded flange forms this flange puller. Pressure screw and a bushing through which it passes are the only added parts.

Millions for Truck Industry Seen When Beer Flows Again

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the coming of real beer will come an immediate growth in breweries.

Back in 1914 when the brewing vocation was considered an eight-billion-dollar industry, there were 1392 breweries in operation. This is the figure ascribed to Professor Herman Feldman of Dartmouth, who is himself a prohibitionist. These breweries supplied the peak consumption of 66,000,000 bbl. of beer in 1914.

John F. Hunt, president of a brewery machinery firm, has declared that there will be 2000 breweries established in the first year of legalized beer.

Perhaps Mr. Hunt is a bit optimistic, because the maximum estimate of anticipated consumption made for taxation purposes stopped at 60,000,000 bbl. Certainly 2000 breweries will not be needed to supply 60,000,000 bbl. if 1392 supplied 66,000,000 bbl. in 1914. And yet it may be that Mr. Hunt allows for the mushroom growth which every industry undergoes when its product gains recognition.

If Mr. Hunt is correct the 2000 additional breweries should, on the basis of most conservative estimates, mean an additional \$30,000,000 in new truck sales. This estimate is the result of figuring five trucks per brewery at the average cost of \$3,000 per truck. This average cost comes from the survey of existing brewers. The figure of five trucks per brewery does not. It is simply picked as an ultra-conservative estimate. The existing breweries average 40 trucks per brewery. But since most of the new breweries will spring up in smaller localities it is practically certain that neither the consumption nor distributing area would require many more trucks than five per brewery.

If you believe Mr. Hunt is over-optimistic perhaps you would like to base your estimate of the potential new truck market on the number of breweries which in 1917 turned out the number of barrels which the experts believe will be consumed when beer comes back? This was accomplished, you remember, by 1392 breweries. Hence you could expect approximately 1200 new breweries to spring up. On this basis, and using the same averages as above, the additional new-truck potential would be 6000 units at a cost of \$18,000,000.

So, considering all these "ifs"—and in the circumstances, there is nothing else you can consider—the truck industry within a year after legalization of beer may sell to the brewing vocation any where from 11,000 to 15,000 new trucks at a cost of from \$32,000,000 to \$44,000,000.

And here again—to figure the benefits to the truck industry as a whole, one must not overlook the benefits that will accrue to the allied branches of the truck industry. The survey presented in tabular form tells the

story for the existing breweries but it would be taxing credulity even more than (it is to be feared) has already been done to attempt to compute estimates for the industry as a whole.

Moreover, this discussion has dealt solely with what beer may bring to the truck industry from the brewing vocation. To approximate the full effect of beer legalization on the truck industry, it is necessary to consider its effect on every branch of the brewing industry.

Cooperage—Which expects to supply 12,000,000 barrels.

Glass—Whose representatives say 864,000,000 bottles would be required, and say nothing about schooners, mugs, shell-glasses and such-like.

Wooden Boxes—Anticipating \$40,000,000 worth of business annually.

Agriculture—Hops and barley growers expect to flourish.

How many new trucks these industries will purchase to replace outworn equipment and to take care of expanded business is a difficult problem to answer but every purchase will certainly contribute to a revival of our own truck industry.

Heavy Gas Taxes Crush Gas and Vehicle Sales

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Columbia having a 2-cent tax. In the others it fell off in just about the inverse ratio to the increase of the tax. (See tabulated figures.)

In the face of such conditions, it is inevitable that the motor manufacturing industry should have touched its low ebb during this year. Excessive taxes meant fewer cars built; less demand for iron, steel, glass, leather, everything that goes into a car. It has meant less business for the railroads; less of about everything, except unemployment.

It seems strange that the automotive and petroleum industries, which are pretty nearly Siamese twins in the business world, should be so persistently singled out as victims of discrimination. Many economists firmly believe that the development of these two industries, along with the construction of our great national system of improved highways, more than anything else was responsible for the country's astonishing prosperity in the last decade. Yet apparently public policy, manifesting itself through the national congress and the state legislatures, seems bent on punishing these industries. Having got gasoline taxes jacked up to the point of extortion, we now confront the fact that 44 state legislatures, meeting this winter, are being put under pressure to legislate against the automotive and oil industries, and against the open highway. It has been dinned into the country's ears that the competition of trucks on the highway is chiefly responsible for the unfortunate financial plight of the railroads. Of course, the railroads are having a bad

time because all business is having a bad time. Railroad volume is nowadays accepted as about the best gage of business conditions; but it would be just as sensible to blame the thermometer when your room got cold, as to give car loadings either credit or blame for business conditions.

However, the railroads' propaganda has about convinced a good many people that the thermometer instead of the furnace is what keeps the house warm. If the railroads have their way a number of states will pass laws this winter severely restricting commercial vehicles on the highways, on the theory that it will somehow help the railroads. Now, the modern highway and the commercial vehicles operating on it have been the best friends and the greatest traffic producers for the railroads. Consider that from 1915 to 1929 the very period in which the trucking industry was built up, the freight revenues of railroads actually increased 140 per cent—from 2126 millions to 4899 millions of dollars. How many other businesses did as well as that?

The truth is that the growth of trucking service in that very period, making it easier and cheaper to bring freight to the rails and to distribute it from them, was one of the important factors in making the railroads so prosperous. The automotive and petroleum industries furnish about 12.6 per cent of all carload freight moved by rail; the outside calculation of freight they take away from the rails is 5 per cent. President Loree of the Delaware & Hudson Railroad declared that the truck tonnage was "so insignificant as to make any effort toward their control by rate regulation scarcely worth while." Daniel Willard, of the Baltimore and Ohio, frankly said concerning the railroads' troubles that "the main cause is the business depression."

But while the more liberal and intelligent railroad leadership recognizes these things, the anti-truck propaganda has been pounding away on its tom-tom until it has become almost impossible for the country to hear the arguments of reason.

Every passenger car operation naturally dislikes the truck; too few of them realize that 9 per cent of all the trucks are carrying the necessities of life to their homes and to the homes of other passenger car operators similarly situated. The truck and its service have become absolutely essential in our present-day mode of living. Nevertheless, there will probably be a considerable amount of legislation this winter designed to hamstring the trucks and suppress highway "competition."

I would like to register right now the carefully considered prediction that legislatures which allow themselves to be stampeded into passing such measures will do their states, and also the railroads, positive harm.

You can't make the clock run backward.

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CORRECTIONS ARE MADE EACH MONTH FROM DATA SUPPLIED DIRECT BY TRUCK MAKERS +

Line Number	MAKE AND MODEL	GENERAL (See Keynote)					TIRE SIZE		MAJOR UNITS							FRAME			
		Tonnage Rating	Chassis Price	Standard Wheelbase	Max. W. B. Furnished	Gross Vehicle Weight	Chassis Wt. (Stripped)	Front	Rear	ENGINE		TRANSMISSION		REAR AXLE			Side Rail Dimensions	Type	
										Make and Model	No. of Cylinders Bore and Stroke	Make and Model	Location and Forward Speeds	Make and Model	Gear and Type	Drive and Torque			Gear Ratios In High In Low
1	A.C.F. 1601	6	6950	186	222	26000	10170	B9.75/22	B9.75/22	Has 160	6-4 1/2 x 5 1/2	BL 1714	U 4 Op	Tim 76730	2F	R 7.46	52.7	8x3	P
2	175B 6 1/2	6 1/2	8300	186	222	26000	10750	B10.50/22	B10.50/22	Has 175	6-5 1/2 x 6	BL 714	U 4 Op	Tim 76730	2F	R 7.46	38.6	8x3	P
3	175A 6 1/2	6 1/2	8800	186	240	30000	11610	B10.50/24	B10.50/24	Has 175	6-5 1/2 x 6	BL 714	U 4 Op	Tim 79730	2F	R 7.48	38.7	8x3	P
4	Armleder 11Ha	2-3	1570	156	195	11500	4070	B7.00/20	DB7.00/20	Con 16C	6-3 3/4 x 4 1/2	Fu WOBB	U 4 No	Tim	BF	H 5.83	31.2	6x3 1/2	P
5	21Ha 2 1/2	2 1/2	2185	160	207	15300	4783	B8.25/20	DB8.25/20	Her WXB	6-3 3/4 x 4 1/2	Fu MLU	U 4 No	Tim	BF	H 6.06	38.5	6x3 1/2	P
6	31Ha 3 1/2-5	3 1/2-5	2745	146	213	19500	5838	B9.00/20	DB9.00/20	Her WXC	6-4 1/2 x 4 1/2	Fu MGU	U 4 No	Tim	BF	R 6.02	39.2	7x3 1/2	P
7	41Ha 4 1/2-5 1/2	4 1/2-5 1/2	3050	160	227	23000	6600	B9.75/20	DB9.75/20	Her WXC	6-4 1/2 x 4 1/2	Fu MGU	U 4 No	Tim	BF	R 6.83	43.8	7x3 1/2	P
8	61Ha 5-7	5-7	3625	146	227	24000	7400	B9.75/20	DB9.75/20	Her WXC2	6-4 1/2 x 4 1/2	Fu MGU	U 4 No	Tim	WF	R 8.5	55.2	8 1/2 x 3 1/2	P
9	71Ha 7-9	7-9	4595	164	235	29500	7800	B10.50/20	DB10.50/20	Her YXC	6-4 1/2 x 4 1/2	Fu VUOG	U 5 No	Tim	WF	R 8.5	55.2	8 1/2 x 3 1/2	P
10	TRHA 10	10	3645	148	174	35000	6250	B9.75/20	DB9.75/20	Her YXC3	6-4 1/2 x 4 1/2	Fu VUOG	U 5 No	Tim	WF	R 7.8	55.1	7x3 1/2	P
11	TRDA 10	10	3895	148	174	39000	6450	B9.75/20	DB9.75/20	Her YXC3	6-4 1/2 x 4 1/2	Fu VUOG	U 5 No	Wis	WF	R 7.8	56.8	7x3 1/2	P
12	Atterbury A 1	1	1095	132	145	7000	3400	P30x5	P30x5	Lye WTG	6-3 1/2 x 4 1/2	Wa T9	U 4 No	Tim 51000H	BF	H 6.20	39.7	5 1/2 x 3 1/2	N
13	K 1 1/2	1 1/2	1595	145	160	8000	3640	P32x6	P32x6	Lye WTD	6-3 1/2 x 4 1/2	Wa T9	U 4 No	Tim 52200H	BF	H 6.50	39.7	5 1/2 x 3 1/2	N
14	DL 2 1/2	2 1/2	1985	160	160	10000	3955	P32x6	DP32x6	Lye 48L	6-3 1/2 x 4 1/2	Co F4B	U 4 No	Tim 54200H	BF	H 6.80	45.1	5 1/2 x 3 1/2	N
15	45-2 1/2	2 1/2	2375	175	188	12000	5300	B7.50/20	DB7.50/20	Lye ASD	6-3 1/2 x 4 1/2	Co W4C	U 4 No	Tim 54200H	BF	H 6.80	39.8	7x3 1/2	N
16	50-2 1/2-3	2 1/2-3	2950	189	202	14000	5800	B8.25/20	DB8.25/20	Lye ASD	6-3 1/2 x 4 1/2	Co W4C	U 4 No	Tim 56200H	BF	H 7.40	43.3	7x3 1/2	N
17	R 3	3	3700	173	199	16040	7250	P34x7	DP34x7	Con 18R	6-4 1/2 x 4 1/2	BL 354	U 4 No	Tim 65001H	WF	H 7.1	37.4	7x3 1/2	N
18	60-3	3	3150	190	215	16000	6900	B9.00/20	DB9.00/20	Lye ASD	6-3 1/2 x 4 1/2	Co W4C	U 4 No	Tim 58200H	BF	H 7.80	45.6	7x3 1/2	N
19	65-3 1/2	3 1/2	4050	209	221	18500	7800	B9.00/20	DB9.00/20	Con 18R	6-4 1/2 x 4 1/2	BL 51-5	U 4 No	Tim 65200H	WF	R 7.50	40.1	8x3 1/2	N
20	70-3 1/2-4	3 1/2-4	4 1/2	222	222	23000	8400	B9.75/20	DB9.75/20	Con 20R	6-4 1/2 x 4 1/2	BL 51-5	U 5 No	Tim 65720H	WF	R 8.50	62.9	8x3 1/2	N
21	C 3 1/2	3 1/2	4750	186	220	19315	8300	B36x8	DP36x8	Con 20R	6-4 1/2 x 4 1/2	BL 51-5	U 4 No	Tim 65706D	WF	H 7.25	38.8	8x3 1/2	N
22	100-5-6	5-6	5675	223	237	28000	9100	B10.50/20	DB10.50/20	Con 21R	6-4 1/2 x 4 1/2	BL 55-7	A 7 No	Tim 66720DH	WF	R 9.0	85.5	9x3 1/2	N
23	Autocar R 1 1/2	1 1/2	2250	159	189	11200	5370	B7.00/20	DB7.00/20	Ow N R	6-3 1/2 x 4 1/2	BL 234	U 4 No	Ow N A	SE	H 5.22	33.5	6 1/2 x 3 1/2	T
24	RF 2 1/2	2 1/2	2450	159	189	11200	5750	B8.25/20	DB8.25/20	Ow N R	6-3 1/2 x 4 1/2	Gw N T	U 4 No	Ow N A	SE	H 5.22	33.0	6 1/2 x 3 1/2	T
25	RG 2 1/2	2 1/2	2600	159	210	11200	5975	P34x7	DP34x7	Ow N R	6-3 1/2 x 4 1/2	Ow N T	U 4 No	Ow N D	SE	H 6.21	39.3	8x3 1/2	T
26	A 2 1/2	2 1/2	3000	150	192	11200	6350	B8.25/20	DB8.25/20	Ow N SD	6-4 1/2 x 4 1/2	Ow N T	U 4 No	Ow N A	SE	H 5.22	33.9	8x3 1/2	T
27	D 3 1/2	3 1/2	3500	150	192	11200	6375	P34x7	DP34x7	Ow N SD	6-4 1/2 x 4 1/2	Ow N T	U 4 No	Ow N D	SE	H 6.21	39.3	8x3 1/2	T
28	DE 3 1/2	3 1/2	3850	150	210	11200	7000	B9.00/20	DB9.00/20	Ow N SD	6-4 1/2 x 4 1/2	Ow N T	U 4 No	Ow N TE	2F	H 6.43	40.7	8x3 1/2	T
29	DF 3 1/2	3 1/2	3950	150	192	11200	7075	B9.00/20	DB9.00/20	Ow N SD	6-4 1/2 x 4 1/2	Ow N T	U 4 No	Ow N TE	2F	H 6.43	40.7	8x3 1/2	T
30	(Eng. und. seat) HS 3 1/2	3 1/2	4600	114	161	11200	7900	P40x8	DP40x8	Ow N M	6-4 1/2 x 5 1/2	Ow N T	U 4 No	Ow N C	2F	H 8.57	54.3	7x2 1/2	T
31	SHS 3 1/2	3 1/2	4800	114	161	11200	7900	P40x8	DP40x8	Ow N SCH	6-4 1/2 x 4 1/2	Ow N T	U 4 No	Ow N C	2F	H 8.57	54.3	7x2 1/2	T
32	DH 4	4	4150	150	171	11200	7250	P36x8	DP36x8	Ow N SD	6-4 1/2 x 4 1/2	Ow N T	U 4 No	Ow N N	2F	H 8.57	54.3	8x3 1/2	T
33	N 4	4	4600	191	227	11200	8090	B9.75/20	DB9.75/20	Ow N SCH	6-4 1/2 x 4 1/2	Ow N T	U 4 No	Ow N N	2F	H 8.57	54.6	9x3 1/2	T
34	NE 5	5	4725	149	170	11200	8300	B9.75/22	DB9.75/22	Ow N SCH	6-4 1/2 x 4 1/2	Ow N T	U 4 No	Ow N D	2F	H 9.92	121.1	10 1/2 x 3 1/2	T
35	NF 5	5	4800	191	227	11200	8350	B9.75/22	DB9.75/22	Ow N SCH	6-4 1/2 x 4 1/2	Ow N D	U 5 No	Ow N TF	2F	H 7.20	42.1	9x3 1/2	T
36	NH 5	5	4925	149	170	11200	8440	B9.75/22	DB9.75/22	Ow N SCH	6-4 1/2 x 4 1/2	Ow N D	U 5 No	Ow N C	2F	H 8.57	50.1	8x3 1/2	T
37	S 5	5	5500	158	168	11200	8800	B9.75/22	DB9.75/22	Ow N SCH	6-4 1/2 x 4 1/2	Ow N T	U 4 A 3	Ow N CG	2F	H 8.52	54.0	9x3 1/2	T
38	SE 6	6	5800	158	168	11200	8950	B10.50/22	DB10.50/22	Ow N SCH	6-4 1/2 x 4 1/2	Ow N T	U 4 A 3	Ow N CG	2F	H 8.52	54.0	9x3 1/2	T
39	C 7 1/2	7 1/2	6600	158	176	11200	10950	B10.50/24	DB10.50/24	Ow N SCH	6-4 1/2 x 4 1/2	BL 734	U 4 A 3	W 78720	2F	H 9.92	121.1	10 1/2 x 3 1/2	T
40	CF 7 1/2	7 1/2	6900	164	182	11200	11280	B10.50/24	DB10.50/24	Wau 6RB	6-5 1/2 x 6	BL 734	U 4 A 3	W 78720	2F	H 9.92	121.1	10 1/2 x 3 1/2	T
41	TE 8 1/2	8 1/2	6900	164	182	11200	11280	B10.50/22	DB10.50/22	Ow N SCH	6-4 1/2 x 4 1/2	Ow N T	U 4 A 3	Ow N TG	2F	H 7.20	38.8	5x3 1/2	T
42	TE 8 1/2	8 1/2	6500	189	207	11200	10700	B10.50/24	DB10.50/24	Ow N SCH	6-4 1/2 x 4 1/2	BL 734	U 4 A 3	Ow N TG	2F	H 7.20	38.7	6 1/2 x 3 1/2	T
43	TF 8 1/2	8 1/2	6800	195	247	11200	10950	B10.50/24	DB10.50/24	Wau 6RB	6-5 1/2 x 6	BL 734	U 4 A 3	Ow N TG	2F	H 7.20	38.7	6 1/2 x 3 1/2	T
44	(T) FE 20	20	9500	180	180	12300	12300	B10.50/24	DB10.50/24	Ste LT	6-5 1/2 x 6	BL 734	U 4 A 3	W 79731	2F	H 7.9	96.0	10 1/2 x 3 1/2	T
45	Available W140	140	1350	168	182	11200	4000	B7.00/20	DB7.00/20	Wau ZK	6-3 1/2 x 4 1/2	WG T9	U 4 No	Tim 53200	SE	R 6.6	42.2	10x2 1/2	T
46	W200 2 1/2	2 1/2	1850	168	182	13400	4500	B7.50/20	DB7.50/20	Wau TL	6-3 1/2 x 4 1/2	BL 224	U 4 No	Tim 54300	SE	R 6.8	43.5	10x2 1/2	T
47	W230 2 1/2-3	2 1/2-3	2075	182	196	16300	5300	B8.25/20	DB8.25/20	Wau 6-90	6-3 1/2 x 4 1/2	BL 234	U 4 No	Tim 56200	SE	R 7.4	47.4	12x2 1/2	T
48	W300 3 1/2	3 1/2	2700	182	196	20700	6000	B9.00/20	DB9.00/20	Wau 6-110	6-4 1/2 x 4 1/2	BL 524	U 4 No	Tim 58200	SE	R 7.8	55.6	12x2 1/2	T
49	W400 3 1/2	3 1/2	3650	Op	Op	25500	8200	B9.75/20	DB9.75/20	Wau 6-125	6-4 1/2 x 4 1/2	BL 615	U 5 No	Tim 65720H	WF	R 8.5	55.6	7x2 1/2	P
50	T43 3/4	3 1/4	3850	Op	Op	25500	8150	B9.75/20	DB9.75/20	Wau SRK	6-4 1/2 x 5 1/2	BL 60	A 7 No	Tim 65720H	WF	R 8.5	80.7	7x2	

TRUCK SPECIFICATIONS TABLE

+ FOR MEANING OF ABBREVIATIONS AND EXPLANATION OF REFERENCE MARKS SEE PAGE 54

Line Number	ENGINE DETAILS										FUEL SYST.	ELEC-TRICAL	FRONT AXLE	BRAKES		BODY MOUNT-ING DATA		SPRINGS		Auxiliary Type											
	Piston Displacement	Compression Ratio	Torque lb. ft.	N.A.-C.C. Rated H.P.	Max. Brake H.P. at R.P.M. Given	Valve Arrangement	Camshaft Drive	Piston Material	MAIN BEARINGS					Governor Make	Carburetors Make	Fuel Feed	Ignition System Make	Generator, Starter Make	Clutch Type and Make		Radiator Make	Universal Make	Make and Model	SERVICE		Hand Type, Location	Cab to Rear of Frame	Cab to Rear Axle	Width of Frame	Front	Rear
									Number and Diameter	Length														Oiling System Type	Lining Area						
1	468	4.4	322	43.3	120-2200	H	C	A	7-3 1/4	10 1/2	CC	Ha	Zen	V	DR	DR	P.B.L	Lo	Spl	Tim 27451	Ros	O41A	720	A	CD	172	102	33 1/2	42x3	56x4	56x4
2	707	4.4	500	60	175-2200	H	C	A	7-3 1/4	14 1/2	CC	Ha	Zen	M	DR	DR	dpLo	Lo	Spl	Tim 27451	Ros	O41A	720	A	CD	172	102	33 1/2	42x3	56x4	56x4
3	248	5.0	150	27	65-2600	H	L	C	7-2 1/2	10 1/2	PC	Mo	Zen	M	DR	DR	P.B.B	Yo	Spl	Tim	Ros	L41H	380	G	TX	129 1/2	Opt	31 1/2	40x2 1/2	50x3	50x3
5	298	4.7	192	33	66-2200	H	L	C	7-2 1/2	13 1/2	PC	Mo	Zen	M	DR	DR	P.B.B	Yo	Spl	Tim	Ros	L41HV	452	G	TX	129 1/2	Opt	31 1/2	40x2 1/2	50x3	50x3
6	339	4.7	225	38	73-2200	H	L	C	7-2 1/2	13 1/2	PC	Mo	Zen	M	DR	DR	P.B.B	Yo	Spl	Tim	Ros	L41HV	578	G	TX	106	Opt	31 1/2	40x2 1/2	62 1/2 x 2 1/2	62 1/2 x 2 1/2
7	360	4.7	225	38	73-2200	H	L	C	7-2 1/2	13 1/2	PC	Mo	Zen	M	DR	DR	P.B.B	Yo	Spl	Tim	Ros	L41HV	578	G	TX	106	Opt	31 1/2	40x2 1/2	62 1/2 x 2 1/2	62 1/2 x 2 1/2
8	360	4.7	225	38	73-2200	H	L	C	7-2 1/2	13 1/2	PC	Mo	Zen	M	DR	DR	P.B.B	Yo	Spl	Shu	Ros	L41HV	768	G	TX	106	Opt	31 1/2	41x2 1/2	62 1/2 x 3	62 1/2 x 3
9	428	4.7	280	46	93-2200	H	L	C	7-3	15	PC	Mo	Zen	M	DR	DR	P.B.B	Yo	Spl	Shu	Ros	L41HV	893	G	TX	118	Opt	31 1/2	41x2 1/2	62 1/2 x 3	62 1/2 x 3
10	478	4.7	318	51	103-2200	H	L	C	7-3	15	PC	Mo	Zen	M	DR	DR	P.B.B	Yo	Spl	Tim	Ros	L41HV	658	G	TX	91 1/2	Opt	31 1/2	41x2 1/2	62 1/2 x 3	62 1/2 x 3
11	478	4.7	318	51	103-2200	H	L	C	7-3	15	PC	Mo	Zen	M	DR	DR	P.B.B	Yo	Spl	Tim	Ros	L41HV	658	G	TX	92	Opt	31 1/2	41x2 1/2	62 1/2 x 3	62 1/2 x 3
12	201	5.5	142	21	64-2800	H	L	C	7-2 1/2	9 1/2	CC	Ha	Zen	G	DR	DR	P.B.B	Fe	Spl	Tim	Gem	L41H	424	P	T	96	53 1/2	34	38x2 1/2	50x2 1/2	50x2 1/2
13	201	5.5	142	21	64-2800	H	L	C	7-2 1/2	9 1/2	CC	Ha	Zen	G	DR	DR	P.B.B	Fe	Spl	Tim	Ros	L41H	437	P	T	118	66 1/2	34	38x2 1/2	50x2 1/2	50x2 1/2
14	224	4.9	146	25	62-2800	H	L	C	7-2 1/2	9 1/2	CC	Ha	Zen	G	DR	DR	P.B.B	Fe	Spl	Tim	Ros	L41H	450	P	T	142	81 1/2	34	38x2 1/2	50x2 1/2	50x2 1/2
15	298	5.0	198	33	85-3000	H	L	C	7-2 1/2	10 1/2	CC	Ha	Zen	M	DR	DR	P.B.B	Fe	Spl	Tim	Ros	L41H	450	P	T	142	81 1/2	34	38x2 1/2	50x2 1/2	50x2 1/2
16	298	5.0	198	33	85-3000	H	L	C	7-2 1/2	10 1/2	CC	Ha	Zen	M	DR	DR	P.B.B	Fe	Spl	Tim	Ros	L41H	450	P	T	142	81 1/2	34	38x2 1/2	50x2 1/2	50x2 1/2
17	339	4.7	225	38	85-2800	H	L	C	7-2 1/2	13 1/2	CC	Ha	Zen	M	DR	DR	P.B.B	Fe	Spl	Tim	Ros	L41H	450	P	T	142	81 1/2	34	38x2 1/2	50x2 1/2	50x2 1/2
18	339	4.7	225	38	85-2800	H	L	C	7-2 1/2	13 1/2	CC	Ha	Zen	M	DR	DR	P.B.B	Fe	Spl	Tim	Ros	L41H	450	P	T	142	81 1/2	34	38x2 1/2	50x2 1/2	50x2 1/2
19	381	4.9	240	40	87-2400	H	L	C	7-2 1/2	13 1/2	CC	Ha	Zen	M	DR	DR	P.B.B	Fe	Spl	Tim	Ros	L41H	450	P	T	142	81 1/2	34	38x2 1/2	50x2 1/2	50x2 1/2
20	381	4.9	240	40	87-2400	H	L	C	7-2 1/2	13 1/2	CC	Ha	Zen	M	DR	DR	P.B.B	Fe	Spl	Tim	Ros	L41H	450	P	T	142	81 1/2	34	38x2 1/2	50x2 1/2	50x2 1/2
21	381	4.9	240	40	87-2400	H	L	C	7-2 1/2	13 1/2	CC	Ha	Zen	M	DR	DR	P.B.B	Fe	Spl	Tim	Ros	L41H	450	P	T	142	81 1/2	34	38x2 1/2	50x2 1/2	50x2 1/2
22	428	4.9	268	45	101-2400	H	L	C	7-2 1/2	13 1/2	CC	Ha	Zen	M	DR	DR	P.B.B	Fe	Spl	Tim	Ros	L41H	450	P	T	142	81 1/2	34	38x2 1/2	50x2 1/2	50x2 1/2
23	428	4.9	268	45	101-2400	H	L	C	7-2 1/2	13 1/2	CC	Ha	Zen	M	DR	DR	P.B.B	Fe	Spl	Tim	Ros	L41H	450	P	T	142	81 1/2	34	38x2 1/2	50x2 1/2	50x2 1/2
24	428	4.9	268	45	101-2400	H	L	C	7-2 1/2	13 1/2	CC	Ha	Zen	M	DR	DR	P.B.B	Fe	Spl	Tim	Ros	L41H	450	P	T	142	81 1/2	34	38x2 1/2	50x2 1/2	50x2 1/2
25	428	4.9	268	45	101-2400	H	L	C	7-2 1/2	13 1/2	CC	Ha	Zen	M	DR	DR	P.B.B	Fe	Spl	Tim	Ros	L41H	450	P	T	142	81 1/2	34	38x2 1/2	50x2 1/2	50x2 1/2
26	428	4.9	268	45	101-2400	H	L	C	7-2 1/2	13 1/2	CC	Ha	Zen	M	DR	DR	P.B.B	Fe	Spl	Tim	Ros	L41H	450	P	T	142	81 1/2	34	38x2 1/2	50x2 1/2	50x2 1/2
27	428	4.9	268	45	101-2400	H	L	C	7-2 1/2	13 1/2	CC	Ha	Zen	M	DR	DR	P.B.B	Fe	Spl	Tim	Ros	L41H	450	P	T	142	81 1/2	34	38x2 1/2	50x2 1/2	50x2 1/2
28	428	4.9	268	45	101-2400	H	L	C	7-2 1/2	13 1/2	CC	Ha	Zen	M	DR	DR	P.B.B	Fe	Spl	Tim	Ros	L41H	450	P	T	142	81 1/2	34	38x2 1/2	50x2 1/2	50x2 1/2
29	428	4.9	268	45	101-2400	H	L	C	7-2 1/2	13 1/2	CC	Ha	Zen	M	DR	DR	P.B.B	Fe	Spl	Tim	Ros	L41H	450	P	T	142	81 1/2	34	38x2 1/2	50x2 1/2	50x2 1/2
30	428	4.9	268	45	101-2400	H	L	C	7-2 1/2	13 1/2	CC	Ha	Zen	M	DR	DR	P.B.B	Fe	Spl	Tim	Ros	L41H	450	P	T	142	81 1/2	34	38x2 1/2	50x2 1/2	50x2 1/2
31	428	4.9	268	45	101-2400	H	L	C	7-2 1/2	13 1/2	CC	Ha	Zen	M	DR	DR	P.B.B	Fe	Spl	Tim	Ros	L41H	450	P	T	142	81 1/2	34	38x2 1/2	50x2 1/2	50x2 1/2
32	428	4.9	268	45	101-2400	H	L	C	7-2 1/2	13 1/2	CC	Ha	Zen	M	DR	DR	P.B.B	Fe	Spl	Tim	Ros	L41H	450	P	T	142	81 1/2	34	38x2 1/2	50x2 1/2	50x2 1/2
33	428	4.9	268	45	101-2400	H	L	C	7-2 1/2	13 1/2	CC	Ha	Zen	M	DR	DR	P.B.B	Fe	Spl	Tim	Ros	L41H	450	P	T	142	81 1/2	34	38x2 1/2	50x2 1/2	50x2 1/2
34	428	4.9	268	45	101-2400	H	L	C	7-2 1/2	13 1/2	CC	Ha	Zen	M	DR	DR	P.B.B	Fe	Spl	Tim	Ros	L41H	450	P	T	142	81 1/2	34	38x2 1/2	50x2 1/2	50x2 1/2
35	428	4.9	268	45	101-2400	H	L	C	7-2 1/2	13 1/2	CC	Ha	Zen	M	DR	DR	P.B.B	Fe	Spl	Tim	Ros	L41H	450	P	T	142	81 1/2	34	38x2 1/2	50x2 1/2	50x2 1/2
36	428	4.9	268	45	101-2400	H	L	C	7-2 1/2	13 1/2	CC	Ha	Zen	M	DR	DR	P.B.B	Fe	Spl	Tim	Ros	L41H	450	P	T	142	81 1/2	34	38x2 1/2	50x2 1/2	50x2 1/2
37	428	4.9	268	45	101-2400	H	L	C	7-2 1/2	13 1/2	CC	Ha	Zen	M	DR	DR	P.B.B	Fe	Spl	Tim	Ros	L41H	450	P	T	142	81 1/2	34	38x2 1/2	50x2 1/2	50x2 1/2
38	428	4.9	268	45	101-2400	H	L	C	7-2 1/2	13 1/2	CC	Ha	Zen	M	DR	DR	P.B.B	Fe	Spl	Tim	Ros	L41H	450	P	T	142	81 1/2	34	38x2 1/2	50x2 1/2	50x2 1/2
39	428	4.9	268	45	101-2400	H	L	C	7-2 1/2	13 1/2	CC	Ha	Zen	M	DR	DR	P.B.B	Fe	Spl	Tim	Ros	L41H	450	P	T	142	81 1/2	34	38x2 1/2	50x2 1/2	50x2 1/2
40	428	4.9	268	45	101-2400	H	L	C	7-2 1/2	13 1/2	CC	Ha	Zen	M	DR																

Line Number	MAKE AND MODEL	GENERAL (See Keynote)				TIRE SIZE		MAJOR UNITS.										FRAME			
		Tonnage Rating	Chassis Price	Standard Wheelbase Max. W. B. Furnished	Gross Vehicle Weight	Chassis Wt. (Stripped)	Front	Rear	ENGINE		TRANSMISSION		REAR AXLE				Gear and Type	Drive and Torque	GEAR RATIOS In High In Low	Side Rail Dimensions	Type
									Make and Model	No. of Cylinders Bore and Stroke	Make and Model	Location and Aux. Location and Speeds	Make and Model	Location and Aux. Location and Speeds	Make and Model	Location and Aux. Location and Speeds					
1	Corbitt (T) 12B6T (conc'd) (T) 15B6T (T) 18D6T (T) 24D6T	4-7 5-8 8-10 10-15	3465 4875 5500 6500	(3) (3) (3) (3)	23900 30400 36200 50600	4870 5870 8100 9200	B8.25/20 B9.00/20 B9.75/20 B10.50/20	DB8.25/20 DB9.00/20 DB9.75/20 DB10.50/20	Con E602 Con E603 Con 22R Con 16H	6-4 1/2 x 4 1/2 6-4 1/2 x 4 1/2 6-4 1/2 x 5 1/2 6-4 1/2 x 5 1/2	BL 335 BL 335 BL 535 BL 7212	U4 U5 U5 U3	No No No Tim	56200H 58200H 75200H 66720W	SF SF SF 2F	H Op H Op H Op H Op	Op Op Op Op	7x3 1/2 x 1 1/2 7x3 1/2 x 1 1/2 8x3 1/2 x 1 1/2 8x3 1/2 x 1 1/2	T T T C		
5	Dart 30G 40G 50G 60G 80W 100W 150W 200W	1 1/2-2 2 1/2-3 2 1/2-3 3 4 4 7 1/2 10	1595 2195 2725 3250 4450 5500 6500 8500	150 150 150 166 170 170 180 180	11200 13400 16300 20700 25600 32000 46100 40400	4900 5650 5750 7425 8500 10500 11500 12500	B6.50/20 B7.50/20 B7.50/20 B8.25/20 B8.25/20 B9.75/20 B9.75/20 B10.50/20	DB6.50/20 DB7.50/20 DB8.25/20 DB9.00/20 DB9.75/20 DB9.75/20 DB10.50/20 DB10.50/20	Her WXA2 Her WXB Her WXC2 Her WXC2 Her YXC2 Her BXC Her HXB Her HXB	6-3 1/2 x 4 1/2 6-3 1/2 x 4 1/2 6-4 1/2 x 4 1/2 6-4 1/2 x 4 1/2 6-4 1/2 x 4 1/2 6-3 1/2 x 5 1/2 6-5 x 6 6-5 x 6	Fu MLU Fu MLU Fu MLU Fu JVOUG Fu VUOG Fu MLU BL 735 BL 735	U4 U4 U4 U5 U4 U4 U5 U5	No No No Tim No No Tim Tim	53200H 54200 56200 58200 B5720 66720 68720 SW310	BF BF BF BF WF WF WF WF	H Op H Op H Op H Op H Op H Op H Op H Op	Op Op Op Op Op Op Op Op	32.6 34.9 31.6 48.4 48.6 48.8 42.7 42.7	7x3 1/2 x 1 1/2 7x3 1/2 x 1 1/2 7x3 1/2 x 1 1/2 7x3 1/2 x 1 1/2 7x3 1/2 x 1 1/2 7x3 1/2 x 1 1/2 9x3 1/2 x 1 1/2 9x3 1/2 x 1 1/2	T T T T T T T T	
13	(4 Whl. Dr.) (4 Whl. Dr.) Day Elder (4) 60 80 100 120 140 160 180 200 240	60 80 100 120 140 160 180 200 240 240	5750 6800 895 1395 1825 2225 2795 3295 4295	180 225 135 156 156 156 156 156 162	19000 24000 6000 8500 10000 13000 16000 20000 24000	8700 11000 3300 3850 4800 6600 6800 7600 9500	B9.00/20 B9.75/20 B6.00/20 B6.50/20 B7.00/20 B7.50/20 B7.50/20 B9.00/20 P38x9	DB9.00/20 DB9.75/20 B6.50/20 B6.50/20 DB7.00/20 DB7.50/20 DB7.50/20 DB9.00/20 DP38x9	Her WXC Her WXC Con 25A Con 16C Con 16C Con 16R Con 18R Con 18R Con 21R	6-4 1/2 x 4 1/2 6-4 1/2 x 5 1/2 6-3 1/2 x 4 1/2 6-3 1/2 x 4 1/2 6-3 1/2 x 4 1/2 6-4 x 4 1/2 6-4 x 4 1/2 6-4 x 4 1/2 6-4 x 4 1/2	Fu JVOUG Fu VUOG WG T9 WG T9 WG T9 BL 51 BL 51 BL 554 BL 535	U5 U5 U4 U4 U4 U4 U4 U4 A5	2 Wls 2 Wls Tim Tim Tim Tim Tim Tim Tim	69317B 69317B 5200H 53200H 5400H 56200H 65200H 6720H	DF DF BF BF BF BF WF WF	H Op H Op H Op H Op H Op H Op H Op H Op	Op Op Op Op Op Op Op Op	153 152 66.36 60.42 80.44 16.40 75.36 50.50	7x3 1/2 x 1 1/2 7x3 1/2 x 1 1/2 9x3 1/2 x 1 1/2 9x3 1/2 x 1 1/2 9x3 1/2 x 1 1/2 7x4 1/2 x 1 1/2 9x3 1/2 x 1 1/2 10x3 1/2 x 1 1/2	P P C C C C C C	
22	Diamond T. 210SF 210FF 240A 310 350 410A 410B 504A (N) 506A 603 (N) 606B 510 750	1 1/2 1 1/2 1 1/2 1 1/2 2 1/2 3 3 3 3 3 3 4-5	545 565 795 995 1295 1695 2135 2650 2950 3395 3695 1995 4925	135 158 157 179 179 194 200 208 240 230 246 168 238	8500 8500 10000 14000 15000 15000 15000 17500 17500 20000 20000 18000 24000	3100 3100 3500 4200 4700 5400 6200 6420 6600 7600 9500 9300 5100	B5.50/20 B5.50/20 B5.50/20 B6.50/20 B7.00/20 B7.50/20 B7.50/20 B8.25/20 B8.25/20 B9.00/20 B7.00/20 B9.75/22 B9.00/20	B6.50/20 B6.50/20 B6.50/20 DB6.50/20 DB7.00/20 DB7.50/20 DB7.50/20 DB8.25/20 DB8.25/20 DB9.00/20 DB8.25/20 DB9.75/22 DB9.00/20	Her JXA Her JXA Her JXA Her JXB Her JXC Her WXC Her WXC Her WXC Her WXC3 Her RXB Her WXC Her RXC Lyc ASD	6-3 1/2 x 4 1/2 6-3 1/2 x 4 1/2 6-3 1/2 x 4 1/2 6-3 1/2 x 4 1/2 6-3 1/2 x 4 1/2 6-4 x 4 1/2 6-4 x 4 1/2 6-4 x 4 1/2 6-4 1/2 x 4 1/2 6-4 1/2 x 5 1/2 6-4 x 4 1/2 6-4 1/2 x 5 1/2 6-4 1/2 x 5 1/2	WG T9 WG T9 WG T9 WG T9 WG T9 Co W5B Co RU84C Co RU84C Co RU5C Co RU5C Co RU84C Co SA5 BL 314	U4 U4 U4 U4 U4 U5 U5 U5 U5 U5 U5 A5	No No No No No Tim Tim Tim Tim Tim Tim Op Tim	56200H 58200H 66720W 66720W 66720W 66720W 66720W 66720W 66720W 66720W 66720W 1737 KW 58200	SF SF SF SF SF SF SF SF SF SF SF BF BF	H Op H Op H Op H Op H Op H Op H Op H Op H Op H Op H Op H Op H Op	Op Op Op Op Op Op Op Op Op Op Op Op Op	34.6 34.6 34.6 34.6 34.6 34.6 34.6 34.6 34.6 34.6 34.6 51.4 51.4	7x2 1/2 x 1 1/2 7x2 1/2 x 1 1/2 7x2 1/2 x 1 1/2 7x2 1/2 x 1 1/2 7x2 1/2 x 1 1/2 7x2 1/2 x 1 1/2 7x2 1/2 x 1 1/2 7x2 1/2 x 1 1/2 7x2 1/2 x 1 1/2 7x2 1/2 x 1 1/2 7x2 1/2 x 1 1/2 12x2 1/2 x 1 1/2	T T T T T T T T T T T P P	
35	Differential E-131 Dodge Bros. F-10																				

Line Number	ENGINE DETAILS										FUEL SYST.	ELEC-TRICAL	FRONT AXLE	BRAKES			BODY MOUNT-ING DATA			SPRINGS		Auxiliary Type									
	Piston Displacement	Compression Ratio	Torque lb. ft.	N.A.C.C. Rated H.P.	Max. Brake H.P. at R.P.M. Given	Valve Arrangement	Camshaft Drive	MAIN BEARINGS						Service	Hand Type, Location	Cab to Rear of Frame	Cab to Rear Axle	Width of Frame	Front	Rear											
								Piston Material	Number and Diameter	Length	Oiling System Type	Governor Make	Carburetors Make								Fuel Feed	Ignition System Make	Generator, Starter Make	Clutch Type and Make	Radiator Make	Universal Make	Make and Model	Steering Gear Make	Make, Location Type, Operation	Lining Area	Drum Material
1300	4.1	24.0	40.8	9.3	2500	L	C	C-7-2 1/2	11 1/2	11 1/2	FP	No	Zen	M	DR	DR	P.B.L	Pe	Spi	Tim 33000H	Ros	L41HV	578	a	TD	(3)	(3)	34	40x2 1/2	54x3	1 1/2
2300	4.1	23.6	43.3	9.5	2500	L	C	C-7-2 1/2	11 1/2	11 1/2	FP	No	Zen	M	DR	DR	P.B.L	Pe	Spi	Tim 33000H	Ros	L41HV	660	a	TD	(3)	(3)	34	40x2 1/2	54x3	1 1/2
3300	4.1	23.6	43.3	9.5	2500	L	C	C-7-2 1/2	11 1/2	11 1/2	FP	No	Zen	M	DR	DR	P.B.L	Pe	Spi	Tim 33000H	Ros	L41HV	768	a	TD	(3)	(3)	34	40x2 1/2	54x3	1 1/2
4300	4.1	23.6	43.3	9.5	2500	L	C	C-7-2 1/2	11 1/2	11 1/2	FP	No	Zen	M	DR	DR	P.B.L	Pe	Spi	Tim 33000H	Ros	L41HV	864	a	TD	(3)	(3)	34	40x2 1/2	54x3	1 1/2
5300	4.1	23.6	43.3	9.5	2500	L	C	C-7-2 1/2	11 1/2	11 1/2	FP	No	Zen	M	DR	DR	P.B.L	Pe	Spi	Tim 33000H	Ros	L41HV	960	a	TD	(3)	(3)	34	40x2 1/2	54x3	1 1/2
6300	4.1	23.6	43.3	9.5	2500	L	C	C-7-2 1/2	11 1/2	11 1/2	FP	No	Zen	M	DR	DR	P.B.L	Pe	Spi	Tim 33000H	Ros	L41HV	1056	a	TD	(3)	(3)	34	40x2 1/2	54x3	1 1/2
7300	4.1	23.6	43.3	9.5	2500	L	C	C-7-2 1/2	11 1/2	11 1/2	FP	No	Zen	M	DR	DR	P.B.L	Pe	Spi	Tim 33000H	Ros	L41HV	1152	a	TD	(3)	(3)	34	40x2 1/2	54x3	1 1/2
8300	4.1	23.6	43.3	9.5	2500	L	C	C-7-2 1/2	11 1/2	11 1/2	FP	No	Zen	M	DR	DR	P.B.L	Pe	Spi	Tim 33000H	Ros	L41HV	1248	a	TD	(3)	(3)	34	40x2 1/2	54x3	1 1/2
9300	4.1	23.6	43.3	9.5	2500	L	C	C-7-2 1/2	11 1/2	11 1/2	FP	No	Zen	M	DR	DR	P.B.L	Pe	Spi	Tim 33000H	Ros	L41HV	1344	a	TD	(3)	(3)	34	40x2 1/2	54x3	1 1/2
10300	4.1	23.6	43.3	9.5	2500	L	C	C-7-2 1/2	11 1/2	11 1/2	FP	No	Zen	M	DR	DR	P.B.L	Pe	Spi	Tim 33000H	Ros	L41HV	1440	a	TD	(3)	(3)	34	40x2 1/2	54x3	1 1/2
11300	4.1	23.6	43.3	9.5	2500	L	C	C-7-2 1/2	11 1/2	11 1/2	FP	No	Zen	M	DR	DR	P.B.L	Pe	Spi	Tim 33000H	Ros	L41HV	1536	a	TD	(3)	(3)	34	40x2 1/2	54x3	1 1/2
12300	4.1	23.6	43.3	9.5	2500	L	C	C-7-2 1/2	11 1/2	11 1/2	FP	No	Zen	M	DR	DR	P.B.L	Pe	Spi	Tim 33000H	Ros	L41HV	1632	a	TD	(3)	(3)	34	40x2 1/2	54x3	1 1/2
13300	4.1	23.6	43.3	9.5	2500	L	C	C-7-2 1/2	11 1/2	11 1/2	FP	No	Zen	M	DR	DR	P.B.L	Pe	Spi	Tim 33000H	Ros	L41HV	1728	a	TD	(3)	(3)	34	40x2 1/2	54x3	1 1/2
14300	4.1	23.6	43.3	9.5	2500	L	C	C-7-2 1/2	11 1/2	11 1/2	FP	No	Zen	M	DR	DR	P.B.L	Pe	Spi	Tim 33000H	Ros	L41HV	1824	a	TD	(3)	(3)	34	40x2 1/2	54x3	1 1/2
15300	4.1	23.6	43.3	9.5	2500	L	C	C-7-2 1/2	11 1/2	11 1/2	FP	No	Zen	M	DR	DR	P.B.L	Pe	Spi	Tim 33000H	Ros	L41HV	1920	a	TD	(3)	(3)	34	40x2 1/2	54x3	1 1/2
16300	4.1	23.6	43.3	9.5	2500	L	C	C-7-2 1/2	11 1/2	11 1/2	FP	No	Zen	M	DR	DR	P.B.L	Pe	Spi	Tim 33000H	Ros	L41HV	2016	a	TD	(3)	(3)	34	40x2 1/2	54x3	1 1/2
17300	4.1	23.6	43.3	9.5	2500	L	C	C-7-2 1/2	11 1/2	11 1/2	FP	No	Zen	M	DR	DR	P.B.L	Pe	Spi	Tim 33000H	Ros	L41HV	2112	a	TD	(3)	(3)	34	40x2 1/2	54x3	1 1/2
18300	4.1	23.6	43.3	9.5	2500	L	C	C-7-2 1/2	11 1/2	11 1/2	FP	No	Zen	M	DR	DR	P.B.L	Pe	Spi	Tim 33000H	Ros	L41HV	2208	a	TD	(3)	(3)	34	40x2 1/2	54x3	1 1/2
19300	4.1	23.6	43.3	9.5	2500	L	C	C-7-2 1/2	11 1/2	11 1/2	FP	No	Zen	M	DR	DR	P.B.L	Pe	Spi	Tim 33000H	Ros	L41HV	2304	a	TD	(3)	(3)	34	40x2 1/2	54x3	1 1/2
20300	4.1	23.6	43.3	9.5	2500	L	C	C-7-2 1/2	11 1/2	11 1/2	FP	No	Zen	M	DR	DR	P.B.L	Pe	Spi	Tim 33000H	Ros	L41HV	2400	a	TD	(3)	(3)	34	40x2 1/2	54x3	1 1/2
21300	4.1	23.6	43.3	9.5	2500	L	C	C-7-2 1/2	11 1/2	11 1/2	FP	No	Zen	M	DR	DR	P.B.L	Pe	Spi	Tim 33000H	Ros	L41HV	2496	a	TD	(3)	(3)	34	40x2 1/2	54x3	1 1/2
22300	4.1	23.6	43.3	9.5	2500	L	C	C-7-2 1/2	11 1/2	11 1/2	FP	No	Zen	M	DR	DR	P.B.L	Pe	Spi	Tim 33000H	Ros	L41HV	2592	a	TD	(3)	(3)	34	40x2 1/2	54x3	1 1/2
23300	4.1	23.6	43.3	9.5	2500	L	C	C-7-2 1/2	11 1/2	11 1/2	FP	No	Zen	M	DR	DR	P.B.L	Pe	Spi	Tim 33000H	Ros	L41HV	2688	a	TD	(3)	(3)	34	40x2 1/2	54x3	1 1/2
24300	4.1	23.6	43.3	9.5	2500	L	C	C-7-2 1/2	11 1/2	11 1/2	FP	No	Zen	M	DR	DR	P.B.L	Pe	Spi	Tim 33000H	Ros	L41HV	2784	a	TD	(3)	(3)	34	40x2 1/2	54x3	1 1/2
25300	4.1	23.6	43.3	9.5	2500	L	C	C-7-2 1/2	11 1/2	11 1/2	FP	No	Zen	M	DR	DR	P.B.L	Pe	Spi	Tim 33000H	Ros	L41HV	2880	a	TD	(3)	(3)	34	40x2 1/2	54x3	1 1/2
26300	4.1	23.6	43.3	9.5	2500	L	C	C-7-2 1/2	11 1/2	11 1/2	FP	No	Zen	M	DR	DR	P.B.L	Pe	Spi	Tim 33000H	Ros	L41HV	2976	a	TD	(3)	(3)	34	40x2 1/2	54x3	1 1/2
27300	4.1	23.6	43.3	9.5	2500	L	C	C-7-2 1/2	11 1/2	11 1/2	FP	No	Zen	M	DR	DR	P.B.L	Pe	Spi	Tim 33000H	Ros	L41HV	3072	a	TD	(3)	(3)	34	40x2 1/2	54x3	1 1/2
28300	4.1	23.6	43.3	9.5	2500	L	C	C-7-2 1/2	11 1/2	11 1/2	FP	No	Zen	M	DR	DR	P.B.L	Pe	Spi	Tim 33000H	Ros	L41HV	3168	a	TD	(3)	(3)	34	40x2 1/2	54x3	1 1/2
29300	4.1	23.6	43.3	9.5	2500	L	C	C-7-2 1/2	11 1/2	11 1/2	FP	No	Zen	M	DR	DR	P.B.L	Pe	Spi	Tim 33000H	Ros	L41HV	3264	a	TD	(3)	(3)	34	40x2 1/2	54x3	1 1/2
30300	4.1	23.6	43.3	9.5	2500	L	C	C-7-2 1/2	11 1/2	11 1/2	FP	No	Zen	M	DR	DR	P.B.L	Pe	Spi	Tim 33000H	Ros	L41HV	3360	a	TD	(3)	(3)	34	40x2 1/2	54x3	1 1/2
31300	4.1	23.6	43.3	9.5	2500	L	C	C-7-2 1/2	11 1/2	11 1/2	FP	No	Zen	M	DR	DR	P.B.L	Pe	Spi	Tim 33000H	Ros	L41HV	3456	a	TD	(3)	(3)	34	40x2 1/2	54x3	1 1/2
32300	4.1	23.6	43.3	9.5	2500	L	C	C-7-2 1/2	11 1/2	11 1/2	FP	No	Zen	M	DR	DR	P.B.L	Pe	Spi	Tim 33000H	Ros	L41HV	3552	a	TD	(3)	(3)	34	40x2 1/2	54x3	1 1/2
33300	4.1	23.6	43.3	9.5	2500	L	C	C-7-2 1/2	11 1/2	11 1/2	FP	No	Zen	M	DR	DR	P.B.L	Pe	Spi	Tim 33000H	Ros	L41HV	3648	a	TD	(3)	(3)	34	40x2 1/2	54x3	1 1/2
34300	4.1	23.6	43.3	9.5	2500	L	C	C-7-2 1/2	11 1/2	11 1/2	FP	No	Zen	M	DR	DR	P.B.L	Pe	Spi	Tim 33000H	Ros	L41HV	3744	a	TD	(3)	(3)	34	40x2 1/2	54x3	1 1/2
35300	4.1	23.6	43.3	9.5	2500	L	C	C-7-2 1/2	11 1/2	11 1/2	FP	No	Zen	M	DR	DR	P.B.L	Pe	Spi	Tim 33000H	Ros	L41HV	3840	a	TD	(3)	(3)	34	40x2 1/2	54x3	1 1/2
36300	4.1	23.6	43.3	9.5	2500	L	C	C-7-2 1/2	11 1/2	11 1/2	FP	No	Zen	M	DR	DR	P.B.L	Pe	Spi	Tim 33000H	Ros	L41HV	3936	a	TD	(3)	(3)	34	40x2 1/2	54x3	1 1/2
37300	4.1	23.6	43.3	9.5	2500	L	C	C-7-2 1/2	11 1/2	11 1/2	FP	No	Zen	M	DR	DR	P.B.L	Pe	Spi	Tim 33000H	Ros	L41HV	4032	a	TD	(3)	(3)	34	40x2 1/2	54x3	1 1/2
38300	4.1	23.6	43.3	9.5	2500	L	C	C-7-2 1/2	11 1/2	11 1/2	FP	No	Zen	M	DR	DR	P.B.L	Pe	Spi	Tim 33000H	Ros	L4									

Line Number	MAKE AND MODEL	GENERAL (See Keynote)				TIRE SIZE		MAJOR UNITS				FRAME									
		Tonnage Rating	Chassis Price	Standard Wheelbase	Max. W. B. Furnished	Gross Vehicle Weight	Chassis Wt. (Stripped)	Front	Rear	ENGINE		TRANSMISSION		REAR AXLE							
										Make and Model	No. of Cylinders Bore and Stroke	Make and Model	Location and Forward Speeds	Make and Model	Gear and Type	Drive and Torque					
																GEAR RATIOS				Type	
																In High	In Low	Side Rail Dimensions			
1	Garford	80Z	4	5330	175	192	24000	8400	S36x6	S36x14	Bud BA6	6-4 1/2 x 5 1/2	BL 60-Max	A 7	No	Tim 66700	WF	R 10.3	98.2	8x3 1/2 x 3 1/2	C
2	General Mot. (6)	100Z	5	5830	175	192	30000	9600	S 36x6	S 36x14	Bud BA6	6-4 1/2 x 5 1/2	BL 60-Max	A 7	No	Tim 68700	WF	R 10.1	95.0	8x3 1/2 x 3 1/2	TL
3	T18	1 1/2	595	131	157	8200	2785	P30x5	P32x6	Ow 200	6-3 1/2 x 3 1/2	Ow 200	U 3	No	Ow 200	WF	H 4.86	16.1	6x2 1/4 x 3 1/2	TL
4	T19	1 1/2	745	130	164	10000	3110	B5.50/20	P32x6	Ow 200	6-3 1/2 x 3 1/2	Ow 200	U 4	Op	Ow 200	WF	U 5.43	35.7	6x2 1/4 x 3 1/2	TL
5	T25	1 1/2	1200	130	152	9000	3375	B6.00/20	B7.50/20	Bulck	6-3 1/2 x 4 1/2	Ow 200	U 4	Op	Ow 200	WF	H 5.83	29.6	6x2 1/4 x 3 1/2	TL
6	T23	2-3	745	131	157	10000	3080	B6.50/20	DB6.50/20	Ow 200	6-3 1/2 x 3 1/2	Ow 200	U 4	Op	Ow 200	WF	H 6.2	40.7	6x2 1/4 x 3 1/2	TL
7	T26	2-3	1210	130	164	11000	3685	B6.50/20	B8.25/20	Ow 257	6-3 1/2 x 4 1/2	Ow 200	U 4	No	Ow 200	WF	H 5.67	35.7	6x2 1/4 x 3 1/2	TL
8	T30	2-3	1543	141	164	12500	4490	P30x5	DP32x6	Bulck	6-3 1/2 x 4 1/2	Ow 200	U 4	No	Ow 200	WF	H 5.63	28.6	6x2 1/4 x 3 1/2	TL
9	T31	2-3	1695	141	181	14000	4695	P32x6	DP32x6	Ow 257	6-3 1/2 x 4 1/2	Ow 200	U 4	No	Ow 200	WF	H 5.63	35.5	6x2 1/4 x 3 1/2	TL
10	T42	2-3	1845	141	181	15000	4725	P32x6	DP32x6	Bulck	6-3 1/2 x 4 1/2	Ow 200	U 4	No	Ow 200	WF	H 6.57	33.4	6x2 1/4 x 3 1/2	TL
11	T44	3-4	2065	141	181	16000	5095	P34x7	DP34x7	Bulck	6-3 1/2 x 4 1/2	Ow 200	U 4	No	Ow 200	WF	R 8.05	40.9	6x2 1/4 x 3 1/2	TL
12	T45	3-4	1865	141	181	16000	4910	P32x6	DP32x6	Ow 257	6-3 1/2 x 4 1/2	Ow 200	U 4	No	Ow 200	WF	R 6.57	41.4	6x2 1/4 x 3 1/2	TL
13	T51	4-5	2465	155	200	19000	5955	P34x7	DP34x7	Ow 331	6-3 1/2 x 4 1/2	Ow 200	U 4	No	Ow 200	WF	R 6.57	40.9	6x2 1/4 x 3 1/2	TL
14	T60	5-6	3035	154	200	22000	6925	P34x7	DP34x7	Bulck	6-3 1/2 x 5	Ow 200	U 4	No	Ow 200	WF	R 8.50	52.5	6x2 1/4 x 3 1/2	TL
15	T61	5-6	3695	154	200	24000	7500	B9.00/20	DB9.00/20	Ow 400	6-3 1/2 x 5	Ow 200	U 4	No	Ow 200	WF	H 5.50	69.9	6x2 1/4 x 3 1/2	TL
16	T82	5-7	3795	155	201	24000	7690	B9.00/20	DB9.00/20	Ow 331	6-3 1/2 x 5	Ow 200	U 4	A 3	Ow 200	WF	R 10.2	143	9x3 1/2 x 3 1/2	TL
17	T83	5-7 1/2	4190	155	201	25000	7690	B9.00/20	DB9.00/20	Ow 400	6-4 1/2 x 5	Ow 200	U 5	Op	Ow 200	WF	R 9.00	74.0	9x3 1/2 x 3 1/2	TL
18	T85	6-8	5600	171	204	30000	10630	B9.75/20	DB9.75/20	Ow 525	6-4 1/2 x 5 1/2	Ow 200	U 5	Op	Ow 200	WF	R 8.50	53.3	9x3 1/2 x 3 1/2	L
19	T110	8-12	8110	171	204	40000	12800	B10.50/24	DB10.50/24	Ow 616	6-4 1/2 x 5 1/2	Ow 200	U 5	A 3	Ow 200	WF	R 9.30	116.9	9x3 1/2 x 3 1/2	L
20	Gramm	AX4	1-1 1/2	795	131	157	8000	3350	B6.50/20	B6.50/20	Con W10	4-3 1/2 x 4 1/2	WG TA	U 4	A 3	Ow 200	BF	H 5.66	36.3	6x2 1/4 x 3 1/2	C
21	AX6	1-1 1/2	895	131	157	8000	3550	B6.50/20	B6.50/20	Con 25A	6-3 1/2 x 4 1/2	WG T9	U 4	No	Tim 53200H	BF	H 5.66	36.3	6x2 1/4 x 3 1/2	L
22	BX4	1-1 1/2	895	131	157	8000	3550	B6.50/20	B6.50/20	Con W10	4-3 1/2 x 4 1/2	WG T9	U 4	No	Tim 53200H	BF	H 5.66	36.3	6x2 1/4 x 3 1/2	L
23	BX4	1-1 1/2	995	131	157	10000	3725	B6.00/20	DB6.00/20	Con 25A	6-3 1/2 x 4 1/2	WG T9	U 4	No	Tim 53200H	BF	H 6.2	39.6	6x2 1/4 x 3 1/2	L
24	BX1	1-1 1/2	149	131	210	10000	4000	B6.00/20	DB6.00/20	Lye ASD	6-3 1/2 x 4 1/2	BL 314	U 4	No	Tim 53200	BF	H 5.6	37.1	6x2 1/4 x 3 1/2	L
25	B2	2-3	1295	140	196	12000	4150	B6.50/20	DB6.50/20	Co A4J	6-3 1/2 x 4 1/2	Co A4J	U 4	No	Tim 54200H	BF	H 5.83	37.1	6x2 1/4 x 3 1/2	L
26	BF	2-3	1695	140	210	12000	4300	B6.50/20	DB6.50/20	Lye ASD	6-3 1/2 x 4 1/2	BL 314	U 4	No	Tim 54200	BF	H 5.8	37.1	6x2 1/4 x 3 1/2	L
27	CX4	2-3	1095	131	210	12000	3950	B6.50/20	DB6.50/20	C n W20	4-4 1/2 x 4 1/2	WG T9	U 4	No	Tim 54200H	BF	H 5.8	37.0	10x2 1/4 x 3 1/2	B
28	CX6	2-3	1295	131	210	12000	4150	B6.50/20	DB6.50/20	Con 16C	6-3 1/2 x 4 1/2	WG T9	U 4	No	Tim 54200H	BF	H 5.8	37.0	10x2 1/4 x 3 1/2	B
29	CX	2-3	1790	160	224	14000	4820	B7.00/20	DB7.00/20	Lye ASD	6-3 1/2 x 4 1/2	BL 314	U 4	No	Tim 54200H	BF	H 5.8	37.0	10x2 1/4 x 3 1/2	B
30	CX	2-3	1345	131	210	13400	4300	B6.50/20	DB6.50/20	Her JXC	6-3 1/2 x 4 1/2	BL 234	U 4	No	Tim 54200	BF	H 5.8	37.0	10x2 1/4 x 3 1/2	B
31	CF	2-3	1895	160	224	14000	4900	B7.50/20	DB7.50/20	Lye ASD	6-3 1/2 x 4 1/2	BL 314	U 4	No	Tim 54200	BF	H 5.8	37.1	7x2 1/4 x 3 1/2	C
32	CX	2-3	2395	160	224	14000	5100	B7.50/20	DB7.50/20	Con 20R	6-4 1/2 x 4 1/2	BL 554	U 4	No	Tim 54200	BF	H 5.8	41.6	7x2 1/4 x 3 1/2	C
33	D	2-3	1995	160	224	17000	5100	B7.50/20	DB7.50/20	Lye ASD	6-3 1/2 x 4 1/2	BL 314	U 4	No	Tim 56200H	BF	H 6.1	39.0	7x2 1/4 x 3 1/2	C
34	DF	2-3	2695	160	260	17000	5300	B8.25/20	DB8.25/20	Con 21R	6-4 1/2 x 4 1/2	BL 554	U 4	No	Tim 56200	BF	H 6.1	43.5	7x2 1/4 x 3 1/2	C
35	EN	3-4	2295	160	224	16300	5200	B8.25/20	DB8.25/20	Con E601	6-3 1/2 x 4 1/2	BL 324	U 4	No	Tim 56200	BF	H 6.1	43.5	7x2 1/4 x 3 1/2	C
36	E330	3-4	3995	160	224	20000	6100	B8.25/20	DB8.25/20	Lye TS	6-3 1/2 x 5	BL 554	U 4	No	Tim 58200	BF	H 5.5	65.6	12x2 1/4 x 3 1/2	P
37	EY190	3-4	3395	190	190	16000	6750	B7.50/20	DB7.50/20	Con 20R	6-4 1/2 x 4 1/2	Co Rus4	U 4	No	Tim 58200	BF	H 4.5	29.1	8x3 1/2 x 3 1/2	L
38	GY4	4-6	4345	190	210	18000	7700	B8.25/20	DB8.25/20	Con 21R	6-4 1/2 x 4 1/2	Co Rus	U 4	No	Tim 58200H	BF	H 4.3	27.9	8x3 1/2 x 3 1/2	L
39	GF4	4-6	3695	150	225	24000	7950	B9.00/20	DB9.00/20	Con 21R	6-4 1/2 x 4 1/2	BL 554	U 4	No	Tim 58200H	BF	H 4.3	27.9	8x3 1/2 x 3 1/2	L
40	GF4	4-6	5500	150	225	24000	9050	B9.75/20	DB9.75/20	Her HXC	6-4 1/2 x 4 1/2	BL 744	U 4	No	Tim 58200H	BF	H 4.3	27.9	8x3 1/2 x 3 1/2	L
41	GW	5-7 1/2	5175	157	240	28000	9500	B9.00/20	DB9.00/20	Con 21R	6-4 1/2 x 4 1/2	BL 554	U 4	No	Tim 58200H	BF	H 4.3	27.9	8x3 1/2 x 3 1/2	L
42	GW	5-7 1/2	6495	157	240	28000	10000	B9.00/20	DB9.00/20	Cum H Die	6-4 1/2 x 4 1/2	BL 744	U 4	No	Tim 58200H	BF	H 4.3	27.9	8x3 1/2 x 3 1/2	L
43	GW	5-7 1/2	6595	157	240	28000	10100	B9.00/20	DB9.00/20	Con 16 Die	6-4 1/2 x 4 1/2	BL 744	U 4	No	Tim 58200H	BF	H 4.3	27.9	8x3 1/2 x 3 1/2	L
44	GW	5-7 1/2	6595	157	240	28000	10100	B9.00/20	DB9.00/20	Con 16 Die	6-4 1/2 x 4 1/2	BL								

Line Number	ENGINE DETAILS										MAIN BEARINGS	Oiling System Type	Governor Make	Carburetors Make	Fuel Feed	Ignition System Make	Generator, Starter Make	Clutch Type and Make	Radiator Make	Universal Make	Steering Gear Make	FRONT AXLE		BRAKES		BODY MOUNTING DATA		SPRINGS		Auxiliary Type			
	Piston Displacement	Compression Ratio	Torque lb. ft.	N.A.C.C. Rated H.P.	Max. Brake H.P. at R.P.M. Given	Valve Arrangement	Camshaft Drive	Piston Material	Number and Diameter	Length												SERVICE		Lining Area	Drum Material	Hand Type, Location	Cab to Rear of Frame	Cab to Rear Axle	Width of Frame		Front	Rear	
																						Make, Location Type, Operation	Lining Area										Drum Material
1	4111	4.5	270	40.8	83-2100	L	G	C	4-2 1/2	9%	PC	Bu	Zen	V	AL	AL	D.Ow	Lo	Blo	Tim	26450H	Ros	L4IH	618	a	FX	144	94 1/2	34	42x3	56x3	1/2	
2	4111	4.5	270	40.8	83-2100	L	G	C	4-2 1/2	9%	PC	Bu	Zen	V	AL	AL	D.Ow	Lo	Blo	Tim	27450H	Ros	L4IH	568	a	FX	144	94 1/2	34	42x3	56x4	1/2	
3	200	4.9	127	26.3	60-3000	L	G	C	4-2 1/2	5%	PC	No	Ma	M	DR	DR	P.Ow	Lo	Lo	Own	Own	Jac	B4IM	211	p	21	85 1/2	48	34	38x2	50 1/2 x 2 1/2	1/2	
4	200	5.1	132	26.3	66-3200	L	G	C	4-2 1/2	5%	PC	No	Ma	M	DR	DR	P.Ow	Lo	Lo	Own	Own	Jac	B4IM	175	p	21	85 1/2	48	34	36x1 1/2	45x2 1/2	1/2	
5	200	5.1	132	26.3	66-3200	L	G	C	4-2 1/2	5%	PC	No	Ma	M	DR	DR	P.Ow	Lo	Lo	Own	Own	Jac	B4IM	290	a	TX	87	48	34	38x2	50 1/2 x 2 1/2	1/2	
6	200	5.1	132	26.3	66-3200	L	G	C	4-2 1/2	5%	PC	No	Ma	M	DR	DR	P.Ow	Lo	Lo	Own	Own	Jac	B4IM	239	p	TX	87	48	34	38x2	50 1/2 x 2 1/2	1/2	
7	200	5.1	132	26.3	66-3200	L	G	C	4-2 1/2	5%	PC	No	Ma	M	DR	DR	P.Ow	Lo	Lo	Own	Own	Jac	B4IM	175	p	21	85 1/2	48	34	36x1 1/2	45x2 1/2	1/2	
8	257	4.5	185	28.3	76-2500	H	G	C	4-2 1/2	8%	PC	Ha	Ma	M	DR	DR	dp.Ow	Lo	Spl	Own	Own	Jac	B4IM	290	a	TX	87	48	34 1/2	38x2	50 1/2 x 2 1/2	1/2	
9	257	4.5	185	28.3	76-2500	H	G	C	4-2 1/2	8%	PC	Ha	Ma	M	DR	DR	dp.Ow	Lo	Spl	Own	Own	Jac	B4IM	288	a	TX	107	59	34 1/2	38x2 1/2	50x3	1/2	
10	257	4.5	185	28.3	76-2500	H	G	C	4-2 1/2	8%	PC	Ha	Ma	M	DR	DR	dp.Ow	Lo	Spl	Own	Own	Jac	B4IM	345	a	TX	107	59	34 1/2	38x2 1/2	50x3	1/2	
11	257	4.5	185	28.3	76-2500	H	G	C	4-2 1/2	8%	PC	Ha	Ma	M	DR	DR	dp.Ow	Lo	Spl	Own	Own	Jac	B4IM	320	a	TX	107	59	34 1/2	38x2 1/2	50x3	1/2	
12	257	4.5	185	28.3	76-2500	H	G	C	4-2 1/2	8%	PC	Ha	Ma	M	DR	DR	dp.Ow	Lo	Spl	Own	Own	Jac	B4IM	320	a	TX	107	59	34 1/2	38x2 1/2	50x3	1/2	
13	257	4.5	185	28.3	76-2500	H	G	C	4-2 1/2	8%	PC	Ha	Ma	M	DR	DR	dp.Ow	Lo	Spl	Own	Own	Jac	B4IM	345	a	TX	107	59	34 1/2	38x2 1/2	50x3	1/2	
14	331	4.2	230	33.7	94-2500	H	G	A	4-2 1/2	8%	PC	Ha	Ma	M	DR	DR	dp.Ow	Lo	Spl	Own	Own	Jac	B4IMV	379	a	TX	125	70	34	40x3	50x3	1/2	
15	331	4.2	230	33.7	94-2500	H	G	A	4-2 1/2	8%	PC	Ha	Ma	M	DR	DR	dp.Ow	Lo	Spl	Own	Own	Jac	B4IM	418	a	TX	125	69 1/2	34	40x3	54x3	1/2	
16	400	4.6	296	40.8	110-2300	H	G	A	4-2 1/2	8%	PC	Ha	Ma	M	DR	DR	dp.Ow	Lo	Spl	Own	Own	Jac	B4IMV	449	a	TX	125	69 1/2	34	40x3	54x3	1/2	
17	400	4.6	296	40.8	110-2300	H	G	A	4-2 1/2	8%	PC	Ha	Ma	M	DR	DR	dp.Ow	Lo	Spl	Own	Own	Jac	B4IMV	483	a	TX	125	70	34	40x3	54x3	1/2	
18	400	4.6	296	40.8	110-2300	H	G	A	4-2 1/2	8%	PC	Ha	Ma	M	DR	DR	dp.Ow	Lo	Spl	Own	Own	Jac	B4IMV	557	a	TX	125	70	34	40x3	54x3	1/2	
19	525	4.5	330	45.9	128-2100	H	G	C	4-2 1/2	14%	PC	En	No	Ma	M	DR	DR	dp.Ow	Lo	Spl	Own	Own	Jac	B4IMV	594	a	TX	137	82	34	50x3 1/2	54x3	1/2
20	525	4.5	330	45.9	128-2100	H	G	C	4-2 1/2	14%	PC	En	No	Ma	M	DR	DR	dp.Ow	Lo	Spl	Own	Own	Jac	B4IMV	594	a	TX	137	82	34	50x3 1/2	54x3	1/2
21	200	4.7	121	24.4	50-2800	L	C	A	3-2 1/2	5%	PC	No	Til	M	AL	AL	D.Jo	Pe	Blo	Tim	30000H	Ros	L4IH	249	p	FD	81 1/2	51 1/2	34	36x2 1/2	45x2 1/2	1/2	
22	214	5.3	142	27.4	71-3200	L	C	A	4-2 1/2	6%	PC	No	Til	M	AL	AL	D.Jo	Pe	Blo	Tim	30000H	Ros	L4IH	249	p	FD	81 1/2	51 1/2	34	36x2 1/2	45x2 1/2	1/2	
23	200	4.7	121	24.4	50-2800	L	C	A	3-2 1/2	5%	PC	No	Til	M	AL	AL	D.Jo	Pe	Blo	Tim	30000H	Ros	L4IH	249	p	FD	81 1/2	51 1/2	34	36x2 1/2	45x2 1/2	1/2	
24	214	5.3	142	27.4	71-3200	L	C	A	4-2 1/2	6%	PC	No	Til	M	AL	AL	D.Jo	Pe	Blo	Tim	30000H	Ros	L4IH	249	p	FD	81 1/2	51 1/2	34	36x2 1/2	45x2 1/2	1/2	
25	299	4.9	198	33.7	85-2800	L	G	C	4-2 1/2	9%	PC	No	Til	M	AL	AL	P.BL	Pe	Blo	Tim	30000	Ros	L4IH	249	p	FD	81 1/2	51 1/2	34	36x2 1/2	45x2 1/2	1/2	
26	224	4.7	146	25.3	61-2800	L	G	C	4-2 1/2	8%	PC	No	Til	M	AL	AL	P.BL	Pe	Blo	Tim	31000H	Ros	L4IH	260	p	FD	94	60 1/2	34	40x2 1/2	50x2 1/2	1/2	
27	299	4.9	198	33.7	85-2800	L	G	C	4-2 1/2	9%	PC	No	Til	M	AL	AL	P.BL	Pe	Blo	Tim	31000	Ros	L4IH	260	p	FD	94	60 1/2	34	40x2 1/2	50x2 1/2	1/2	
28	227	4.7	136	27.3	55-2400	L	G	C	3-2 1/2	5%	PC	No	Til	M	AL	AL	D.Jo	Pe	Blo	Tim	31000H	Ros	L4IH	269	p	FD	81	51 1/2	34	36x2 1/2	45x2 1/2	1/2	
29	248	5.0	150	27.3	70-3000	L	G	C	7-2 1/2	10%	PC	No	Til	M	AL	AL	D.Jo	Pe	Blo	Tim	31000H	Ros	L4IH	260	p	FD	81	51 1/2	34	36x2 1/2	45x2 1/2	1/2	
30	278	4.7	182	31.5	85-3300	L	G	A	7-2 1/2	9%	PC	No	Til	M	AL	AL	P.BL	Pe	Blo	Tim	31000H	Ros	L4IH	260	p	FD	120	77 1/2	34	42x2 1/2	56x3	1/2	
31	282	5.4	176	33.7	73-2800	L	G	C	7-2 1/2	10%	PC	No	Til	M	AL	AL	P.BL	Pe	Blo	Tim	31000H	Ros	L4IH	260	p	FD	81	51 1/2	34	36x2 1/2	45x2 1/2	1/2	
32	299	4.9	198	33.7	85-2800	L	G	C	4-2 1/2	9%	PC	No	Til	M	AL	AL	P.BL	Pe	Blo	Tim	31000	Ros	L4IH	260	p	FD	120	77 1/2	34	42x2 1/2	56x3	1/2	
33	380	4.3	238	40.8	88-400	H	G	C	7-2 1/2	13%	PC	No	Til	M	AL	AL	P.BL	Pe	Blo	Tim	31000	Ros	L4IH	260	p	FD	120	77 1/2	34	42x2 1/2	56x3	1/2	
34	299	4.9	198	33.7	85-2800	L	G	C	4-2 1/2	9%	PC	No	Til	M	AL	AL	P.BL	Pe	Blo	Tim	33000	Ros	L4IHV	330	a	FD	120	77 1/2	34	42x2 1/2	56x3	1/2	
35	428	4.1	268	45.9	100-2200	H	G	C	7-2 1/2	12%	CC	No	Til	M	AL	AL	P.BL	Pe	Blo	Tim	33000H	Ros	L4IHV	330	a	FD	120	77 1/2	34	42x2 1/2	56x3	1/2	
36	318	4.5	203	36.2	80-2700	L	G	C	7-2 1/2	12%	CC	No	Til	M	AL	AL	P.BL	Pe	Blo	Tim	33000H	Ros	L4IHV	330	a	FD	120	77 1/2	34	42x2 1/2	56x3	1/2	
37	353	4.8	245	36.2	98-2700	L	G	C	4-2 1/2	10%	PC	No	Til	M	AL	AL	D.Jo	Pe	Blo	Tim	33000H	Ros	L4IHV	375	a	FD	127	74 1/2	34	42x2 1/2	56x3	1/2	
38	448	17	280	38.0	83-1800	H	C	N	5-2 1/2	12%	P	En	No	M	CI	LN	D.BL	Pe	Blo	Tim	33000	Ros	L4IHV	375	a	FD	127	74 1/2	34	42x2 1/2	56x3	1/2	
39	380	4.3	238	40.8	88-2400	H	C	C	7-2 1/2	13%	PC	No	Til	M	AL	AL	D.Jo	Pe	Blo	Eat	423												

Line Number	MAKE AND MODEL	GENERAL (See Keynote)					TIRE SIZE		MAJOR UNITS										FRAME				
		Tonnage Rating	Chassis Price	Standard Wheelbase	Max. W. B. Furnished	Gross Vehicle Weight	Chassis Wt. (Stripped)	Front	Rear	ENGINE		TRANSMISSION		REAR AXLE				Gear and Type	Drive and Torque	GEAR RATIOS		Side Rail Dimensions	Type
										Make and Model	No. of Cylinders Bore and Stroke	Make and Model	Location and Forward Speeds	Aux. Location and Speeds	Make and Model	In High	In Low						
1	Lange (concluded)	F16 4	5500	148	188	23000	8600	P40x8	DP40x8	Her YXC	6-4 1/2 x 4 1/2	BL 60	A7	No	Wis 1552B	2F	R10.0	95.5	8x3x 1/4	P			
2	VA 5	5775	148	188	26000	9200	P40x8	DP40x8	Her YXC2	6-4 1/2 x 4 1/2	BL 60	A7	No	Wis 1700	2F	R10.0	96.0	8x3x 1/4	P			
3	VA 5	6200	194	242	26000	9950	P47 5/24	DP9 7/24	Her RXC	6-4 1/2 x 5 1/2	BL 714	U4	A2	Wis 1737KW	2F	R10.0	96.0	7x2 1/2 x 1 1/4	P			
4	Le Moon.....	150 1 1/2	1150	140	152	8000	3300	B6.50/20	B6.50/20	Con 16C	6-3 1/2 x 4 1/2	BL 214	U4	No	Tim 53200H	BF	H 5.14	31.8	6x3x 1/4	P			
5	300 2 1/2	1350	160	178	11200	3600	B7.00/20	DB7.00/20	Con 16C	6-3 1/2 x 4 1/2	BL 214	U4	No	Tim 53200H	BF	H 5.14	31.8	6x3x 1/4	P			
6	400 3 1/2	1575	163	190	12600	4200	B7.50/20	DB7.50/20	Con 16C	6-3 1/2 x 4 1/2	BL 214	U4	No	Tim 54200H	BF	H 6.16	40.2	6 1/2 x 3 1/4 x 1/4	C			
7	500 4 1/2	2175	163	190	15300	5000	B8.25/20	DB8.25/20	Wau 6MS	6-3 1/2 x 4 1/2	BL 314	U4	No	Tim 56200H	BF	H 6.16	40.2	6 1/2 x 3 1/4 x 1/4	C			
8	500 4 1/2	2775	160	190	19500	6000	B9.00/20	DB9.00/20	Wau 6SR	6-4 1/2 x 4 1/2	BL 514	U4	No	Tim 58200H	BF	H 7.14	40.6	7x4 1/4 x 1/4	C			
9	500 4 1/2	3150	160	190	19500	6500	B9.00/20	DB9.00/20	Wau 6SR	6-4 1/2 x 4 1/2	Fu VUOG	U5	No	Tim 58200H	BF	H 6.14	40.6	7x4 1/4 x 1/4	C			
10	500 4 1/2	3600	160	190	21600	7200	B9.75/20	DB9.75/20	Wau 6SR	6-4 1/2 x 4 1/2	Fu VUOG	U5	No	Tim 58200H	BF	R 6.00	43.2	7x4 1/4 x 1/4	P			
11	Maccar.....	100 1 1/2	1330	151	167	10000	4165	B6.50/20	DB6.50/20	Bud J214	6-3 1/2 x 4 1/2	Wa T9	U4	No	Tim 53000H	BF	N 6.2	39.2	7x2 1/2 x 1/4	P			
12	35A 1 1/2	2050	153	183	12000	4850	B7.00/20	DB7.00/20	Bud H298	6-3 1/2 x 4 1/2	BL 314	U4	No	Tim 54200H	BF	R 4.86	32	6 1/2 x 3 1/4 x 1/4	C			
13	40A 2 1/2	2400	155	183	15000	5350	B7.50/20	DB7.50/20	Bud H298	6-3 1/2 x 4 1/2	BL 314	U4	No	Tim 56200H	BF	R 6.16	38.7	7x3x 1/4	C			
14	180 3 1/2	3500	181	213	18000	7400	B9.00/20	DB9.00/20	Bud K393	6-4 1/2 x 4 1/2	BL 554	U4	No	Wis 8787L	2F	R 6.0	49.3	9x3x 1/4	P			
15	250 4 1/2	3500	181	213	18000	7400	B9.00/20	DB9.00/20	Bud DW6	6-4 1/2 x 4 1/2	BL 51	U4	No	Wis 8787L	2F	R 6.0	49.3	9x3x 1/4	P			
16	300 5 1/2	3950	153	207	18000	6600	B9.00/20	DB9.00/20	Bud BA6	6-4 1/2 x 5 1/2	BL 514	U4	No	Tim 75200H	2F	R 6.4	34.4	8x3x 1/4	T			
17	350 6 1/2	4750	153	207	22000	7300	B9.75/20	DB9.75/20	Bud BA6	6-4 1/2 x 5 1/2	BL 554	U4	No	Tim 75200H	2F	R 6.8	43	8x3x 1/4	T			
18	400 7 1/2	5500	181	213	22000	8750	B9.75/20	DB9.75/20	Her YXC3	6-4 1/2 x 5 1/2	BL 615	A5	No	Tim 65720W	WF	R 6.8	44.5	12x3x 1/4	T			
19	450 8 1/2	6000	181	213	22000	8750	B9.75/20	DB9.75/20	Wau 6SR	6-4 1/2 x 5 1/2	BL 615	A5	No	Tim 65720W	WF	R 6.6	47.9	9x3x 1/4	T			
20	500 9 1/2	6500	181	213	22000	8750	B9.75/20	DB9.75/20	Wau 6SR	6-4 1/2 x 5 1/2	BL 615	A5	No	Tim 65720W	WF	R 6.6	47.9	9x3x 1/4	T			
21	550 10 1/2	7000	181	213	22000	8750	B9.75/20	DB9.75/20	Her YXC3	6-4 1/2 x 5 1/2	BL 70	A5	No	Tim 65720W	WF	R 6.6	47.9	9x3x 1/4	T			
22	Mack.....	BL 1 1/2	2200	138	148	9500	4050	B6.00/20	DB6.00/20	Own BL	6-3 1/2 x 5	Own BG	U4	No	Tim 52000B2	SF	H 5.66	27.7	6x3x 1/4	T			
23	BG 1 1/2	3000	138	192	12000	4800	P32x6	DP32x6	Own BG	6-3 1/2 x 5	Own BG	U4	No	Own BG	SF	H 5.44	26.8	7x3x 1/4	T			
24	BF 2 1/2	4200	156	198	16000	6600	B8.25/20	DB8.25/20	Own BG	6-3 1/2 x 5	Own BG	U4	No	Own BG	SF	H 7.01	33.9	7 1/2 x 3x 1/4	T			
25	AB 3 1/2	4000	147	219	17500	6450	P34x7	DP34x7	Own AB	4-4 1/2 x 5	Own AB	U4	No	Own AB	CD	R 7.72	37.4	8x2 1/2 x 1/4	T			
26	AB 3 1/2	4200	147	219	17500	6700	P34x7	DP34x7	Own AB	4-4 1/2 x 5	Own AB	U4	No	Own AB	CD	R 7.58	36.7	8x2 1/2 x 1/4	T			
27	AB 3 1/2	4150	147	219	17500	6700	P34x7	DP34x7	Own AB	4-4 1/2 x 5	Own AB	U4	No	Own AB	CD	R 7.72	37.4	8x2 1/2 x 1/4	T			
28	AB 3 1/2	4200	147	219	17500	6700	P34x7	DP34x7	Own AB	4-4 1/2 x 5	Own AB	U4	No	Own AB	CD	R 7.72	37.4	8x2 1/2 x 1/4	T			
29	BM 3 1/2	4700	157	217	21500	7500	B9.00/20	DB9.00/20	Own BC	6-4 1/2 x 5	Own BC	U4	No	Own BC	2F	H 7.01	40.9	7 1/2 x 3x 1/4	T			
30	BC 4 1/2	5250	154	226	23500	7850	P36x8	DP36x8	Own BC	6-4 1/2 x 5	Own BC	U4	No	Own BC	2F	H 7.58	44.2	8 1/2 x 3x 1/4	T			
31	BC 4 1/2	5500	154	226	23500	8000	P36x8	DP36x8	Own BC	6-4 1/2 x 5	Own BC	U4	No	Own BC	2F	H 7.88	46.0	8 1/2 x 3x 1/4	T			
32	BC 4 1/2	5750	160	214	24800	7900	B9.75/22	DB9.75/22	Own BC	6-4 1/2 x 5	Own BC	U4	No	Own BC	2F	H 7.88	46.0	8 1/2 x 3x 1/4	T			
33	BX 4 1/2	5600	160	214	24700	8050	B9.75/22	DB9.75/22	Own BC	6-4 1/2 x 5	Own BC	U4	No	Own BC	2F	H 7.88	46.0	8 1/2 x 3x 1/4	T			
34	AC Light	4950	168	240	28000	9200	B10.50/24	DB10.50/24	Own AC	4-5x6	Own AC	U4	No	Own AC	2F	H 7.54	53.1	19 1/2 x 3x 1/4	T			
35	AC Medium	5483	183	288	32000	10000	B10.50/22	DB10.50/22	Own AC	4-5x6	Own AC	U4	No	Own AC	2F	H 7.54	53.1	19 1/2 x 3x 1/4	T			
36	AC Heavy	6000	168	240	37000	10150	P36x7	DP36x7	Own AC	4-5x6	Own AC	U4	No	Own AC	2F	H 7.54	53.1	19 1/2 x 3x 1/4	T			
37	AP 7 1/2-10	8500	191	191	36500	11700	P36x7	DP36x7	Own AC	4-5x6	Own AC	U4	No	Own AC	2F	H 7.54	53.1	19 1/2 x 3x 1/4	T			
38	AP 7 1/2-10	8500	191	191	36500	11700	P36x7	DP36x7	Own AC	4-5x6	Own AC	U4	No	Own AC	2F	H 7.54	53.1	19 1/2 x 3x 1/4	T			
39	TL 27-2	3785	120	135	12000	5500	B7.50/20	DB7.50/20	Her JXC	6-3 1/2 x 4 1/2	BL 328	U4	No	Own Wis	SF	H 6.06	26.7	6x3x 1/4	T			
40	TL 27-2	4285	158	188	15250	7250	B8.25/20	DB8.25/20	Her WXC	6-4 1/2 x 4 1/2	BL 328	U4	No	Own Wis	SF	H 6.06	26.7	6x3x 1/4	T			
41	TL 29-3	4950	168	240	17200	7700	B8.25/22	DB8.25/22	Her WXC	6-4 1/2 x 4 1/2	Fu MGU	U4	No	Own Wis	SF	H 6.06	26.7	6x3x 1/4	T			
42	TL 29-3	5483	183	288	18700	8370	B9.00/20	DB9.00/20	Her WXC3	6-4 1/2 x 4 1/2	Fu MGU	U4	No	Own Wis	SF	H 6.06	26.7	6x3x 1/4	T			
43	TH-300	6285	163	193	20300	9300	B9.75/20	DB9.75/20	Her YXC	6-4 1/2 x 4 1/2	Fu VUOG	U5A	2	Own Wis	2F	H 7.01	40.9	7 1/2 x 3x 1/4	T			
44	TH-310	6785	163	193	22620	9620	B9.75/20	DB9.75/20	Her YXC3	6-4 1/2 x 4 1/2	Fu VUOG	U5A	2	Own Wis	2F	H 7.01	40.9	7 1/2 x 3x 1/4	T			
45	TH-310A	7785	163	193	25120	10120	B9.75/22	DB9.75/22	Her XNC	6-4 1/2 x 4 1/2	Fu VUOG	U5A	2	Own Wis	2F	H 7.01	40.9	7 1/2 x 3x 1/4	T			
46	TH-320	10598	198	228	31200	14200	B10.50/22	DB10.50/22	Her HNB	6-5x6	BL 724	U4	3	Own Wis	2F	H 7.01	40.9	7 1/2 x 3x 1/4	T			
47	TH-330	12500	198	228	33920	14920	B11.25/24	DB11.25/24	Her HND	6-5x6	BL 734	U4	3	Own Wis	2F	H 7.01	40.9	7 1/2 x 3x 1/4	T			
48	RR-10	1195	159	159	12000	4585	P32x6	DP32x6	Her JXC	6-3 1/2 x 4 1/2	BL 224	U4	No	Tim 53200H	SF	R 5.83	36.1	7 1/2 x 3x 1/4	T			
49	B13.15																					

Line Number	ENGINE DETAILS										FUEL SYST.	ELEC-TRICAL	FRONT AXLE	BRAKES		BODY MOUNT-ING DATA		SPRINGS															
	Piston Displacement	Compression Ratio	Torque lb. ft.	N.A.C.C. Rated H.P.	Max. Brake H.P. at R.P.M. Given	Valve Arrangement	Camshaft Drive	MAIN BEARINGS		Governor Make				Carburetors Make	Fuel Feed	Ignition System Make	Generator, Starter Make	Clutch Type and Make	Radiator Make	Universals Make	Steering Gear Make	SERVICE		Hand Type, Location	Cab to Rear of Frame	Cab to Rear Axle	Width of Frame	Front	Rear	Auxiliary Type			
								Piston Material	Number and Diameter													Length	Make, Location Type, Operation								Lining Area	Drum Material	
1428	4.4	280	45.9	94	2200	L	G	C	7-3	15	PC	Pe	Str	M	AL	AL	D.B.L	Mo	Spl	Tim	16300	Ros	W21M	802	G	TD	154 1/2	99 1/2	37	44x3	56x4	1/2	
2453	4.8	300	48.6	99	2200	L	G	C	7-3	15	PC	Ha	Str	M	AL	LN	P.B.L	Mo	Spl	Tim	16300	Ros	W21M	802	G	TD	154 1/2	99 1/2	37	44x3	56x4	1/2	
3529	4.8	350	51.3	112	2200	L	G	C	7-3	12 1/2	PC	Ha	Str	M	AL	LN	P.B.L	Mo	Spl	Tim	26450W	Ros	W41A	576	G	TD	Opt	Opt	33	44x3	56x3	1/2	
4248	4.4	150	27.3	65	2800	L	L	C	C	7-2 1/2	10 1/2	PC	No	Str	M	DR	DR	D.B.L	Ch	Spl	Tim	30000H	Ros	L41H	275	C	TX	96	58	34	37 1/2 x 2 1/2	49 1/2 x 2 1/2	1/2
5248	4.4	150	27.3	65	2800	L	L	C	C	7-2 1/2	10 1/2	PC	No	Str	M	DR	DR	D.B.L	Ch	Spl	Tim	30000H	Ros	L41H	275	C	TX	128	81	34	37 1/2 x 2 1/2	50x2 1/2	1/2
6248	4.4	150	27.3	65	2800	L	L	C	C	7-2 1/2	10 1/2	PC	No	Str	M	DR	DR	D.B.L	Ch	Spl	Tim	31000H	Ros	L41H	293	C	TX	128	81	34	37 1/2 x 2 1/2	50x2 1/2	1/2
7315	4.6	200	33.7	72	2500	L	L	C	C	7-2 1/2	12 1/2	PC	No	Str	M	DR	DR	D.B.L	Ch	Spl	Tim	33000H	Ros	L41H	345	C	TX	128	81	34	37 1/2 x 2 1/2	50 1/2 x 2 1/2	1/2
8381	4.4	242	40.8	85	2500	L	L	C	C	7-2 1/2	12 1/2	PC	No	Str	M	DR	DR	D.B.L	Ch	Spl	Tim	35000H	Ros	L41HV	385	C	CD	128	81	34	39x2 1/2	53x3	1/2
9462	4.5	300	45.9	98	2000	L	G	A	7-3	13 1/2	PC	Wa	Str	M	DR	DR	D.Fu	Ch	Spl	Tim	35000H	Ros	L41HV	385	C	CD	128	81	34	39x2 1/2	53x3	1/2	
10462	4.5	300	45.9	98	2000	L	G	A	7-3	13 1/2	PC	Wa	Str	M	DR	DR	D.Fu	Ch	Spl	Tim	35000H	Ros	L41HV	485	C	RI	128	81	34	39x2 1/2	53x3	1/2	
11260	4.5	162	27.3	60	2500	L	G	C	7-2 1/2	8 1/2	FP	Ha	Str	M	DR	DR	P.B.B	Pe	Spl	Tim	30000H	Ros	L41H	313	A	TD	118	80	32	40x2 1/2	54x2 1/2	1/2	
12298	4.7	188	33.7	73	2800	L	G	C	7-3	9 1/2	FP	Ha	Str	M	DR	DR	P.B.L	Pe	Spl	Tim	31000H	Ros	L41H	293	A	TD	114	72 1/2	32	42x2 1/2	54x2 1/2	1/2	
13298	4.7	188	33.7	73	2800	L	G	C	7-3	9 1/2	FP	Ha	Str	M	DR	DR	P.B.L	Pe	Spl	Tim	31000H	Ros	L41H	343	A	TD	114	72 1/2	32	42x2 1/2	54x2 1/2	1/2	
14393	4.5	200	33.7	73	2100	L	G	C	4-2 1/2	9	FP	Bu	Str	V	DR	DR	D.B.L	Pe	Spl	Tim	35020H	Ros	L41HV	412	A	FD	107 1/2	70	32	42x2 1/2	58 1/2 x 3	1/2	
15331	4.5	200	33.7	73	2100	L	G	C	4-2 1/2	9	FP	Bu	Str	V	DR	DR	D.B.L	Pe	Spl	Tim	35020H	Ros	L41HV	412	A	FD	107 1/2	70	32	42x2 1/2	58 1/2 x 3	1/2	
16411	4.5	272	40.8	103	2100	L	G	C	4-2 1/2	9 1/2	FP	Ha	Str	M	DR	DR	D.B.L	Pe	Spl	Tim	35020H	Ros	L41HV	412	A	TD	104 1/2	68	32	42x2 1/2	54x3	1/2	
17411	4.5	272	40.8	103	2100	L	G	C	4-2 1/2	9 1/2	FP	Ha	Str	M	DR	DR	D.B.L	Pe	Spl	Tim	35020H	Ros	L41HV	527	A	TD	104 1/2	68	32	42x2 1/2	54x3	1/2	
18479	4.5	318	51.2	102	2000	L	G	C	7-3	14	CC	Ha	Zen	M	DR	DR	D.B.L	Pe	Spl	Tim	26450TW	Ros	W41A	618	A	TD	144	95	33	42x3	58x3	1/2	
19517	4.5	335	51.3	106	2000	L	G	A	7-3	14	CC	Ha	Str	M	DR	DR	P.B.L	Ow	Spl	Tim	35000H	Ros	W41A	600	A	TD	143 1/2	91 1/2	32	42x3	58 1/2 x 3	1/2	
20517	4.5	335	51.3	106	2000	L	G	A	7-3	14	CC	Ha	Str	M	DR	DR	P.B.L	Ow	Spl	Tim	35000H	Ros	W41A	600	A	TD	143 1/2	91 1/2	32	42x3	58 1/2 x 3	1/2	
21479	4.5	318	51.2	102	2000	L	G	C	7-3	14	CC	Ha	Zen	M	DR	DR	D.B.L	Pe	Spl	Tim	26450TW	Ros	W41A	623	A	TD	144	95	33	42x3	58x3	1/2	
22485	5.1	145	25.4	61	2600	L	G	C	7-2 1/2	11 1/2	FP	Ha	Str	M	NE	NE	D.Ow	Ow	Spl	Tim	35020H	Ros	L41H	302	P	FX	109	64 1/2	33 1/2	40 1/2 x 2 1/2	52 1/2 x 2 1/2	1/2	
23309	4.7	183	31.5	75	2500	L	G	C	7-2 1/2	11 1/2	FP	Ha	Str	M	NE	NE	D.Ow	Ow	Spl	Tim	35020H	Ros	L41H	302	P	FX	109	64 1/2	33 1/2	40 1/2 x 2 1/2	52 1/2 x 2 1/2	1/2	
24309	4.7	183	31.5	75	2500	L	G	C	7-2 1/2	11 1/2	FP	Ha	Str	M	NE	NE	D.Ow	Ow	Spl	Tim	35020H	Ros	L41H	302	P	FX	109	64 1/2	33 1/2	40 1/2 x 2 1/2	52 1/2 x 2 1/2	1/2	
25283	4.4	176	28.9	63	2100	L	G	C	3-3	8 1/2	PS	Ow	Str	G	NE	NE	D.Ow	Ow	Spl	Tim	35020H	Ros	L41H	302	P	FX	109	64 1/2	33 1/2	40 1/2 x 2 1/2	52 1/2 x 2 1/2	1/2	
26283	4.4	176	28.9	63	2100	L	G	C	3-3	8 1/2	PS	Ow	Str	G	NE	NE	D.Ow	Ow	Spl	Tim	35020H	Ros	L41H	302	P	FX	109	64 1/2	33 1/2	40 1/2 x 2 1/2	52 1/2 x 2 1/2	1/2	
27309	4.7	183	31.5	75	2500	L	G	C	7-2 1/2	11 1/2	FP	Ha	Str	M	NE	NE	D.Ow	Ow	Spl	Tim	35020H	Ros	L41H	302	P	FX	109	64 1/2	33 1/2	40 1/2 x 2 1/2	52 1/2 x 2 1/2	1/2	
28309	4.7	183	31.5	75	2500	L	G	C	7-2 1/2	11 1/2	FP	Ha	Str	M	NE	NE	D.Ow	Ow	Spl	Tim	35020H	Ros	L41H	302	P	FX	109	64 1/2	33 1/2	40 1/2 x 2 1/2	52 1/2 x 2 1/2	1/2	
29309	4.7	183	31.5	75	2500	L	G	C	7-2 1/2	11 1/2	FP	Ha	Str	M	NE	NE	D.Ow	Ow	Spl	Tim	35020H	Ros	L41H	302	P	FX	109	64 1/2	33 1/2	40 1/2 x 2 1/2	52 1/2 x 2 1/2	1/2	
30309	4.7	183	31.5	75	2500	L	G	C	7-2 1/2	11 1/2	FP	Ha	Str	M	NE	NE	D.Ow	Ow	Spl	Tim	35020H	Ros	L41H	302	P	FX	109	64 1/2	33 1/2	40 1/2 x 2 1/2	52 1/2 x 2 1/2	1/2	
31414	5.261	38.4	94	2400	L	G	C	7-3	13 1/2	FP	Ha	Str	M	RB	NE	P.Ow	Ow	Spl	Tim	35020H	Ros	L41H	302	P	FX	109	64 1/2	33 1/2	40 1/2 x 2 1/2	52 1/2 x 2 1/2	1/2		
32488	4.7	292	43.4	104	2300	L	G	C	7-3	13 1/2	FP	Ha	Str	M	RB	NE	P.Ow	Ow	Spl	Tim	35020H	Ros	L41H	302	P	FX	109	64 1/2	33 1/2	40 1/2 x 2 1/2	52 1/2 x 2 1/2	1/2	
33468	4.7	292	43.4	104	2300	L	G	C	7-3	13 1/2	FP	Ha	Str	M	RB	NE	P.Ow	Ow	Spl	Tim	35020H	Ros	L41H	302	P	FX	109	64 1/2	33 1/2	40 1/2 x 2 1/2	52 1/2 x 2 1/2	1/2	
34524	4.8	350	48.6	125	2300	L	G	C	4-3 1/2	11 1/2	PS	Ow	Str	M	RB	NE	P.Ow	Ow	Spl	Tim	35020H	Ros	L41H	302	P	FX	109	64 1/2	33 1/2	40 1/2 x 2 1/2	52 1/2 x 2 1/2	1/2	
35611	5.0	398	54.2	128	2200	L	G	C	4-3 1/2	11 1/2	PS	Ow	Str	M	RB	NE	P.Ow	Ow	Spl	Tim	35020H	Ros	L41H	302	P	FX	109	64 1/2	33 1/2	40 1/2 x 2 1/2	52 1/2 x 2 1/2	1/2	
36471	3.9	932	40.0	75	1800	L	G	C	3-3	10 1/2	PS	Ow	Str	G	RB	NS	P.Ow	Ow	Spl	Tim	35020H	Ros	L41H	302	P	FX							

Line Number	MAKE AND MODEL	GENERAL (See Keynote)					TIRE SIZE		MAJOR UNITS					FRAME					
		Wheels Driven—6-Wheelers	Tonnage Rating	Chassis Price	Standard Wheelbase	Max. W. B. Furnished	Gross Vehicle Weight	Chassis Wt. (Stripped)	Front	Rear	ENGINE		TRANSMISSION		REAR AXLE				
											Make and Model	No. of Cylinders Bore and Stroke	Make and Model	Location and Aux. Location and Speeds	Make and Model	Gear and Type	Drive and Torque	GEAR RATIOS	
																		In High	In Low
1	Schacht (concluded)	40H	5-7	4295	154	235	25500	7600	B9.75/20	Her YXC	6-4 1/2 x 4 1/2	Fu VUOG	U5	No Own	2F	R 7.07	49.78 1/2 x 3 1/2	P	
2	66HA	8-11	5895	152	247	35000	9820	B10.50/24	Her YXC	6-4 1/2 x 4 1/2	Fu VUOG	U5	No Wis	2F	R 7.07	49.78 1/2 x 3 1/2	P		
3	(T) TRDA	10	3645	148	174	35000	6250	B9.75/20	Her YXC3	6-4 1/2 x 4 1/2	Fu VUOG	U5	No Tim	2F	R 7.8	55.17 1/2 x 3 1/2	P		
4	(T) TRDA	10	3895	148	174	39000	6450	B9.75/20	Her YXC3	6-4 1/2 x 4 1/2	Fu VUOG	U5	No Own	2F	R 7.8	56.87 1/2 x 3 1/2	P		
5	STERLING	FB40	1 1/2-2	1135	142	162	10000	3450	B6.50/20	Con 25A	6-3 1/2 x 4	Wa T9	U4	No Own	BF	H 5.66	36.26 1/2 x 3 1/2	C	
6	FB40	2 1/2-3 1/2	1240	142	162	11000	3650	B7.00/20	Con 25A	6-3 1/2 x 4	Wa T9	U4	No Own	BF	H 5.66	36.26 1/2 x 3 1/2	C		
7	FB40	2 1/2-3 1/2	1590	142	162	12000	4150	B7.00/20	Wau TL	6-3 1/2 x 4 1/2	Wa T9	U4	No Own	BF	H 5.83	37.62 1/2 x 3 1/2	C		
8	FB70	2 1/2-3 1/2	2635	174	204	13000	5755	B7.50/20	Wau ML	6-4 1/2 x 4 1/2	Own UC7	U5	No Own	2F	R 7.4	52.71 10 1/2 x 3 1/2	L		
9	FB80	3 1/2-4 1/2	3065	174	204	16000	6680	B8.25/20	Wau GML	6-4 1/2 x 4 1/2	Own UC7	U5	Op Own	2F	R 7.8	55.33 10 1/2 x 3 1/2	L		
10	FB80	3 1/2-4 1/2	3010	174	204	16000	6680	B8.25/20	Wau ML	6-4 1/2 x 4 1/2	Own UC7	U5	Op Own	2F	R 7.8	55.33 10 1/2 x 3 1/2	L		
11	FC90	4	4105	174	204	18000	7480	B9.00/20	Wau GML	6-4 1/2 x 4 1/2	Own UC7	U5	Op Own	2F	R 8.66	61.71 10 1/2 x 3 1/2	L		
12	FD90	4	3315	174	204	18000	7480	B9.00/20	Wau MK	6-4 1/2 x 4 1/2	Own UC7	U5	Op Own	2F	R 8.0	57.07 10 1/2 x 3 1/2	L		
13	FW97S	FD97S	5	4355	192	222	19500	8200	P36x8	Wau 6SRL	6-4 1/2 x 5 1/2	Own UC2	U4	Op Own	w/2F	R 7.75	51.62 12 1/2 x 3 1/2	L	
14	FC100	5-5 1/2	4185	192	222	20000	7750	P36x8	Wau 6SRL	6-4 1/2 x 5 1/2	Own UC2	U4	Op Own	CD	R 9.3	61.22 12 1/2 x 3 1/2	L		
15	FC105	5-5 1/2	4645	192	222	21000	8000	B9.00/20	Wau 6SRL	6-4 1/2 x 5 1/2	Own UC2	U4	Op Own	CD	R 8.66	61.71 12 1/2 x 3 1/2	L		
16	FW115	FD115	5-6	4690	192	222	23000	8750	P40x8	Wau 6SRL	6-4 1/2 x 5 1/2	Own UC2	U4	Op Own	w/2F	R 8.20	54.62 12 1/2 x 3 1/2	L	
17	FC107	5-6	4700	192	222	21500	8200	P36x8	Wau 6SRL	6-4 1/2 x 5 1/2	Own UC2	U4	Op Own	CD	R 8.20	54.62 12 1/2 x 3 1/2	L		
18	FC1208	7 1/2	4900	192	222	24000	8400	B9.75/20	Wau 6SRL	6-4 1/2 x 5 1/2	Own UC2	U4	Op Own	CD	R 8.66	61.71 12 1/2 x 3 1/2	L		
19	FW140	FD140	7-8	6005	192	222	28000	10050	P40x8	Wau 6SRL	6-4 1/2 x 5 1/2	Own UC2	U4	Op Own	w/2F	R 10.0	66.62 15 1/2 x 3 1/2	L	
20	FC140	8-8 1/2	4800	192	222	27000	8900	P40x8	Wau 6SRL	6-4 1/2 x 5 1/2	Own UC2	U4	Op Own	CD	R 9.3	62.22 15 1/2 x 3 1/2	L		
21	FC145	8-8 1/2	5595	200	230	28000	9350	P40x8	Wau HB	6-4 1/2 x 5 1/2	Own UC2	U4	Op Own	CD	R 8.3	55.22 15 1/2 x 3 1/2	L		
22	FW170	FD170	9-10	6180	200	230	29000	10100	P40x8	Wau AB	6-4 1/2 x 5 1/2	Own UC8	U4	Op Own	CD	R 9.4	58.99 15 1/2 x 3 1/2	L	
23	FC175	9-10	6180	200	230	29000	10100	P40x8	Wau AB	6-4 1/2 x 5 1/2	Own UC8	U4	Op Own	w/2F	R 10.0	62.71 15 1/2 x 3 1/2	L		
24	FD190	12-12 1/2	9505	210	240	39000	10750	B10.50/24	Cum H Die.	6-4 1/2 x 5 1/2	WG	U4	No Cla	1910W	WF	R 8.5	55.22 15 1/2 x 3 1/2	T	
25	Stewart	41X	1 1/2	795	134	176	9000	3525	B6.50/20	Lyc	6-3 1/2 x 4 1/2	WG	U4	No Cla	2F	R 7.5	44.71 9 1/2 x 2 1/2	T	
26	42X	2 1/2	995	145	176	9000	3525	B6.50/20	Lyc	6-3 1/2 x 4 1/2	WG	U4	No Cla	2F	R 7.5	44.71 9 1/2 x 2 1/2	T		
27	43X	2 1/2	1095	145	176	9000	3525	B6.50/20	Lyc	6-3 1/2 x 4 1/2	WG	U4	No Cla	2F	R 7.5	44.71 9 1/2 x 2 1/2	T		
28	29X8	2 1/2	1695	145	190	9000	4990	B7.00/20	Lyc	6-3 1/2 x 4 1/2	Ful	U4	No Cla	2F	R 6.37	44.71 9 1/2 x 2 1/2	T		
29	32X	2 1/2	1990	165	220	9000	5260	B7.00/20	Lyc	6-3 1/2 x 4 1/2	Fu	U4	No Cla	2F	R 6.37	44.71 9 1/2 x 2 1/2	T		
30	58-8	2 1/2	2390	170	226	9000	5970	B7.50/20	Lyc	8-3 1/2 x 4 1/2	Fu	U4	No Cla	2F	R 7.25	47.59 9 1/2 x 2 1/2	T		
31	18X	2 1/2	2690	170	226	9000	6400	B7.50/20	Lyc	8-3 1/2 x 4 1/2	Fu	U4	No Tim	2F	R 7.25	47.59 9 1/2 x 2 1/2	T		
32	19X	3 1/2	2990	170	241	9000	6750	B8.25/20	Lyc	8-3 1/2 x 4 1/2	BL	U4	No Cla	2F	R 7.12	50.19 9 1/2 x 2 1/2	T		
33	38-6	3 1/2	3690	165	231	9000	7110	B9.00/20	Lyc	6-3 1/2 x 5	Fu	U4	A 3 Tim	2F	R 7.25	127.92 1/2 x 3 1/2	T		
34	38-8	3 1/2	3990	170	241	9000	7600	B9.00/20	Wau	6-4 1/2 x 5 1/2	BL	U4	A 3 Tim	2F	R 7.3	147.92 1/2 x 3 1/2	T		
35	31X	5	5190	165	235	9000	9340	B9.75/20	Lyc	8-3 1/2 x 4 1/2	BL	U4	A 3 Tim	2F	R 8.2	151.92 1/2 x 3 1/2	T		
36	27X	7 1/2	670	130	165	9000	3110	B6.00/20	Own	6-3 1/2 x 4 1/2	War T9	U4	No Cla	B373	SF	H 5.66	36.26 1/2 x 3 1/2	T	
37	Studebaker	(11) 8-1 1/2-2 1/2	785	130	165	10500	3385	B6.00/20	Own	6-3 1/2 x 4 1/2	War T9	U4	No Cla	B412	SF	H 5.66	36.26 1/2 x 3 1/2	T	
38	8-6	2 1/2	945	141	163	12000	3930	B6.50/20	Own	6-3 1/2 x 4 1/2	War T9	U4	No Tim	54200	SF	H 6.8	43.57 8 1/2 x 2 1/2	T	
39	8-8	2 1/2	1350	141	163	16000	4855	B6.50/20	Own	6-3 1/2 x 4 1/2	War T9	U4	A 2 Tim	58200	SF	H 6.8	75.88 8 1/2 x 2 1/2	T	
40	Walter	FN 2 1/2-3 1/2	4500	120	144	18000	7500	B9.00/20	Own 6MK	6-4 1/2 x 5 1/2	Own FN	U5	No Own	FN	2D	H 7.0	70.72 8 1/2 x 2 1/2	T	
41	FM 3 1/2-4 1/2	4500	120	144	18000	7500	B9.00/20	Own 6SRL	6-4 1/2 x 5 1/2	Own FM	U5	No Own	FM	2D	H 6.00	60.01 8 1/2 x 2 1/2	T		
42	FKL	4500	120	144	18000	7500	B9.00/20	Own 6SRL	6-4 1/2 x 5 1/2	Own FM	U5	No Own	FM	2D	H 6.00	60.01 8 1/2 x 2 1/2	T		
43	FBS	7-9	7200	136	160	27000	9500	B9.75/24	Own 6SRL	6-4 1/2 x 5 1/2	Own FK	U5	No Own	FK	2D	H 8.50	85.01 13 1/2 x 3 1/2	P	
44	FBS	7-9	7900	136	160	27000	9500	B9.75/24	Own 6RB	6-5 1/2 x 5 1/2	Own FH	U5	No Own	FH	2D	H 8.5	85.01 13 1/2 x 3 1/2	P	
45	FBS	7-9	8300	136	160	32000	10500	B10.50/24	Own 6RB	6-5 1/2 x 5 1/2	Own FH	U5	No Own	FH	2D	H 8.5	85.01 13 1/2 x 3 1/2	P	
46	White	(12) 60K 1 1/2-1 1/2	1850	138	157	9000	3905	B7.00/20	Own 2A	6-3 1/2 x 4 1/2	Own 3BC	U3	No Own	4C	8 1/2	H 5.87	22.25 8 1/2 x 3 1/2	C	
47	60L 1 1/2-1 1/2	1850	138	157	9000	3905	B7.00/20	Own 2A	6-3 1/2 x 4 1/2	Own 3BC	U3	No Own	4C	8 1/2	H 5.87	22.25 8 1/2 x 3 1/2	C		
48	60L 1 1/2-1 1/2	1850	138	157	9000	3905	B7.00/20	Own 2A	6-3 1/2 x 4 1/2	Own 3BC	U3	No Own	4C	8 1/2	H 5.87	22.25 8 1/2 x 3 1/2	C		
49	60L 1 1/2-1 1/2	1850	138	157	9000	3905	B7.00/20	Own 2A	6-3 1/2 x 4 1/2	Own 3BC	U3	No Own	4C	8 1/2	H 5.87	22.25 8 1/2 x 3 1/2	C		
50	60L 1 1/2-1 1/2	1850	138	157	9000	3905	B7.00/20	Own 2A	6-3 1/2 x 4 1/2	Own 3BC	U3	No Own	4C	8 1/2	H 5.87	22.25 8 1/2 x 3 1/2	C		
51	60L 1 1/2-1 1/2	1850	138	157	9000	3905	B7.00/20	Own 2A	6-3 1/2 x 4 1/2	Own 3BC	U3	No Own	4C	8 1/2	H 5.87	22.25 8 1/2 x 3 1/2	C		
52	60L 1 1/2-1 1/2	1850	138	157	9000	3905	B7.00/20	Own 2A	6-3 1/2 x 4 1/2	Own 3BC	U3	No Own	4C	8 1/2	H 5.87	22.25 8 1/2 x 3 1/2	C		
53																			

Line Number	ENGINE DETAILS										FUEL SYST.	ELEC-TRICAL	FRONT AXLE	BRAKES		BODY MOUNT-ING DATA		SPRINGS		Auxiliary Type													
	Piston Displacement	Compression Ratio	Torque lb. ft.	N.A.C. Rated H.P.	Max. Brake H.P. at P.M. Given	Valve Arrangement	Camshaft Drive	MAIN BEARINGS		Piston Material				Governor Make	Carburetors Make	Fuel Feed	Ignition System Make	Generator, Starter Make	Clutch Type and Make		Radiator Make	Universal Make	Make and Model	Steering Gear Make	SERVICE		Hand Type, Location	Cab to Rear of Frame	Width of Frame	Front	Rear		
								Number and Diameter	Length																Oiling System Type	Make, Location Type Operation						Lining Area	Drum Material
1428	4.4	280	45.9	93-2200	L	C	7-3	15	PC	Mo	Zen	MAL	AL	AL	D.Fu	Yo	Spi	Shu	Ros	L41HV	768	H	TD	106	Opt	31 1/2	40x2 1/2	50x3					
2428	4.4	280	45.9	93-2200	L	C	7-3	15	PC	Mo	Zen	MAL	AL	AL	D.Fu	Yo	Spi	Shu	Ros	Own	W541A	847	G	TD	118	Opt	31 1/2	40x2 1/2	50x3				
3429	4.4	280	45.9	115-2200	L	C	7-3	15	PC	Mo	Zen	MAL	AL	AL	D.Fu	Yo	Spi	Shu	Ros	Own	W541A	847	G	TD	118	Opt	31 1/2	40x2 1/2	50x3				
4478	4.4	318	51.2	103-2200	L	C	7-3	15	PC	Mo	Zen	MAL	AL	AL	D.Fu	Yo	Spi	Tim	Ros	L41HV	768	G	TD	91 1/2	Opt	31 1/2	40x2 1/2	50x3					
5478	4.4	318	51.2	103-2200	L	C	7-3	15	PC	Mo	Zen	MAL	AL	AL	D.Fu	Yo	Spi	Tim	Ros	L41HV	768	G	TD	91 1/2	Opt	31 1/2	40x2 1/2	50x3					
6478	4.4	318	51.2	103-2200	L	C	7-3	15	PC	Mo	Zen	MAL	AL	AL	D.Fu	Yo	Spi	Tim	Ros	L41HV	768	G	TD	91 1/2	Opt	31 1/2	40x2 1/2	50x3					
7214	5.0	137	28.0	72-3300	L	C	7-3	15	CC	Ha	Zen	MAL	AL	AL	D.Fu	Yo	Spi	Tim	Ros	L41HV	768	G	TD	91 1/2	Opt	31 1/2	40x2 1/2	50x3					
8255	5.0	137	28.0	72-3300	L	C	7-3	15	CC	Ha	Zen	MAL	AL	AL	D.Fu	Yo	Spi	Tim	Ros	L41HV	768	G	TD	91 1/2	Opt	31 1/2	40x2 1/2	50x3					
9358	4.4	230	38.4	80-2500	L	C	7-3	12 1/2	CC	Ha	Zen	MAL	AL	AL	D.Fu	Yo	Spi	Tim	Ros	L41HV	768	G	TD	91 1/2	Opt	31 1/2	40x2 1/2	50x3					
10358	4.4	230	38.4	80-2500	L	C	7-3	12 1/2	CC	Ha	Zen	MAL	AL	AL	D.Fu	Yo	Spi	Tim	Ros	L41HV	768	G	TD	91 1/2	Opt	31 1/2	40x2 1/2	50x3					
11358	4.4	230	38.4	80-2500	L	C	7-3	12 1/2	CC	Ha	Zen	MAL	AL	AL	D.Fu	Yo	Spi	Tim	Ros	L41HV	768	G	TD	91 1/2	Opt	31 1/2	40x2 1/2	50x3					
12381	4.4	240	40.0	85-2500	L	C	7-3	12 1/2	CC	Ha	Zen	MAL	AL	AL	D.Fu	Yo	Spi	Tim	Ros	L41HV	768	G	TD	91 1/2	Opt	31 1/2	40x2 1/2	50x3					
13381	4.4	240	40.0	85-2500	L	C	7-3	12 1/2	CC	Ha	Zen	MAL	AL	AL	D.Fu	Yo	Spi	Tim	Ros	L41HV	768	G	TD	91 1/2	Opt	31 1/2	40x2 1/2	50x3					
14381	4.4	240	40.0	85-2500	L	C	7-3	12 1/2	CC	Ha	Zen	MAL	AL	AL	D.Fu	Yo	Spi	Tim	Ros	L41HV	768	G	TD	91 1/2	Opt	31 1/2	40x2 1/2	50x3					
15381	4.4	240	40.0	85-2500	L	C	7-3	12 1/2	CC	Ha	Zen	MAL	AL	AL	D.Fu	Yo	Spi	Tim	Ros	L41HV	768	G	TD	91 1/2	Opt	31 1/2	40x2 1/2	50x3					
16411	4.6	260	40.0	91-2400	L	C	7-3	13 1/2	CC	Ha	Zen	MAL	AL	AL	D.Fu	Yo	Spi	Tim	Ros	L41HV	768	G	TD	91 1/2	Opt	31 1/2	40x2 1/2	50x3					
17462	4.5	300	45.9	102-2400	L	C	7-3	13 1/2	CC	Ha	Zen	MAL	AL	AL	D.Fu	Yo	Spi	Tim	Ros	L41HV	768	G	TD	91 1/2	Opt	31 1/2	40x2 1/2	50x3					
18462	4.5	300	45.9	102-2400	L	C	7-3	13 1/2	CC	Ha	Zen	MAL	AL	AL	D.Fu	Yo	Spi	Tim	Ros	L41HV	768	G	TD	91 1/2	Opt	31 1/2	40x2 1/2	50x3					
19462	4.5	300	45.9	102-2400	L	C	7-3	13 1/2	CC	Ha	Zen	MAL	AL	AL	D.Fu	Yo	Spi	Tim	Ros	L41HV	768	G	TD	91 1/2	Opt	31 1/2	40x2 1/2	50x3					
20462	4.5	300	45.9	102-2400	L	C	7-3	13 1/2	CC	Ha	Zen	MAL	AL	AL	D.Fu	Yo	Spi	Tim	Ros	L41HV	768	G	TD	91 1/2	Opt	31 1/2	40x2 1/2	50x3					
21462	4.5	300	45.9	102-2400	L	C	7-3	13 1/2	CC	Ha	Zen	MAL	AL	AL	D.Fu	Yo	Spi	Tim	Ros	L41HV	768	G	TD	91 1/2	Opt	31 1/2	40x2 1/2	50x3					
22489	4.5	295	43.4	90-2000	L	C	4-3 1/2	11 1/2	CC	Ha	Zen	MAL	AL	AL	D.Fu	Yo	Spi	Tim	Ros	L41HV	768	G	TD	91 1/2	Opt	31 1/2	40x2 1/2	50x3					
23549	4.5	330	48.6	99-2000	L	C	4-3 1/2	11 1/2	CC	Ha	Zen	MAL	AL	AL	D.Fu	Yo	Spi	Tim	Ros	L41HV	768	G	TD	91 1/2	Opt	31 1/2	40x2 1/2	50x3					
24549	4.5	330	48.6	99-2000	L	C	4-3 1/2	11 1/2	CC	Ha	Zen	MAL	AL	AL	D.Fu	Yo	Spi	Tim	Ros	L41HV	768	G	TD	91 1/2	Opt	31 1/2	40x2 1/2	50x3					
25677	4.6	440	60.0	125-2000	L	C	4-3 1/2	10 1/2	CC	Ha	Zen	MAL	AL	AL	D.Fu	Yo	Spi	Tim	Ros	L41HV	768	G	TD	91 1/2	Opt	31 1/2	40x2 1/2	50x3					
26727	4.6	440	60.0	125-2000	L	C	4-3 1/2	10 1/2	CC	Ha	Zen	MAL	AL	AL	D.Fu	Yo	Spi	Tim	Ros	L41HV	768	G	TD	91 1/2	Opt	31 1/2	40x2 1/2	50x3					
2707	4.8	142	23.4	56-2600	L	C	4-3 1/2	10 1/2	PC	No	Zen	P	DR	P	BB	Fe	Spi	Spi	Ros	B41M	180	A	CX	81	41 1/2	32 1/2	38 1/2 x 2 1/2	50x2 1/2					
28244	4.8	142	23.4	62-2800	L	C	4-3 1/2	8 1/4	PC	No	Zen	P	DR	P	BB	Fe	Spi	Spi	Ros	B41M	257	A	TX	92	51 1/2	32 1/2	38 1/2 x 2 1/2	50x2 1/2					
29242	5.0	193	33.8	85-2750	L	C	4-2 1/2	9 1/4	FP	Mo	Str	P	DR	P	BB	Fe	Spi	Spi	Ros	B41M	308	A	TX	104 1/2	58 1/2	32 1/2	38 1/2 x 2 1/2	50x3					
30299	5.0	193	33.8	85-2750	L	C	4-2 1/2	9 1/4	FP	Mo	Str	P	DR	P	BB	Fe	Spi	Spi	Ros	B41M	308	A	TX	104 1/2	58 1/2	32 1/2	38 1/2 x 2 1/2	50x3					
31224	4.6	224	36.2	90-2750	L	C	4-2 1/2	10	FP	Mo	Str	P	DR	P	BB	Fe	Spi	Spi	Ros	B41M	348	A	TX	127 1/2	79 1/2	32 1/2	38 1/2 x 2 1/2	50x3					
32322	5.2	225	36.5	90-2750	L	C	4-2 1/2	10	FP	Mo	Str	P	DR	P	BB	Fe	Spi	Spi	Ros	B41M	348	A	TX	127 1/2	79 1/2	32 1/2	38 1/2 x 2 1/2	50x3					
33420	5.2	225	36.5	90-2750	L	C	4-2 1/2	10	FP	Mo	Str	P	DR	P	BB	Fe	Spi	Spi	Ros	B41M	348	A	TX	127 1/2	79 1/2	32 1/2	38 1/2 x 2 1/2	50x3					
34420	5.2	225	36.5	90-2750	L	C	4-2 1/2	10	FP	Mo	Str	P	DR	P	BB	Fe	Spi	Spi	Ros	B41M	348	A	TX	127 1/2	79 1/2	32 1/2	38 1/2 x 2 1/2	50x3					
35354	4.6	224	36.2	90-2750	L	C	4-2 1/2	10	PS	Mo	Str	P	DR	P	BB	Fe	Spi	Eat	Ros	B41M	453	A	TX	126 1/2	76 1/2	32 1/2	40x3	56x3					
36462	4.6	224	36.2	90-2750	L	C	4-2 1/2	10	PS	Mo	Str	P	DR	P	BB	Fe	Spi	Eat	Ros	B41M	453	A	TX	126 1/2	76 1/2	32 1/2	40x3	56x3					
37420	5.2	230	44.4	130-2800	L	C	4-3 1/2	12 1/2	FP	Mo	Str	P	DR	P	BB	Fe	Spi	Eat	Ros	B41M	453	A	TX	128 1/2	75 1/2	32 1/2	40x3	56x3					
38516	4.5	330	51.2	100-1900	L	C	7-3	12 1/2	FP	Mo	Str	P	DR	P	BB	Fe	Spi	Eat	Ros	B41M	453	A	TX	128 1/2	75 1/2	32 1/2	40x3	56x3					
39516	4.5	330	51.2	100-1900	L	C	7-3	12 1/2	FP	Mo	Str	P	DR	P	BB	Fe	Spi	Eat	Ros	B41M	453	A	TX	128 1/2	75 1/2	32 1/2	40x3	56x3					
40230	4.6	154	25.4	75-3200	L	C	4-2 1/2	8 1/2	CC	Ha	Str	M	DR	DR	P	Lo	Mc	Cle	Ros	W41A	759	A	TX	128 1/2	73 1/4	34	40x3	56x4					
41230	4.6	154	25.4	75-3200	L	C	4-2 1/2	8 1/2	CC	Ha	Str	M	DR	DR	P	Lo	Mc	Cle	Ros	W41A	759	A	TX	128 1/2	73 1/4	34	40x3	56x4					
42230	4.6	154	25.4	75-3200	L	C	4-2 1/2	8 1/2	CC	Ha	Str	M	DR	DR	P	Lo	Mc	Cle	Ros	W41A	759	A	TX	128 1/2	73 1/4	34	40x3	56x4					
43230	4.6	154	25.4	75-3200	L	C	4-2 1/2	8 1/2	CC	Ha	Str	M	DR	DR	P	Lo	Mc	Cle	Ros	W41A	759	A	TX	128 1/2	73 1/4	34	40x3	56x4					
44381	4.5	240	40.0	85-2200	L	C	7-3 1/2	12 1/2	FP	Mo	Str	P	DR	P	BB	Fe	Spi	Own	Own	FM	600	D	FX	126	84	34	48x4	52x4					
45462	4.5	300	46.0	100-1900	L	C	7-3	13 1/2	PC	Mo	Zen	V	Se	DR	P	OW	Own	Own	Own	FM	600	D	FX	126	84	34	48x4	52x4					
46462	4.5	300	46.0	100-1900	L	C	7-3	13 1/2	PC	Mo	Zen	V	Se	DR	P	OW	Own	Own	Own	FM	600	D	FX	126	84	34	48x4	52x4					
47517	4.5	330	51.0	110-1900	A	C	7-3	13 1/2	PC	Mo	Zen	V	Se	DR	P	OW	Own	Own	Own	FM	600	D	FX	126	84	34	48x4	52x4					
48677	4.5	440	60.0	130-1900	L	C	7-3 1/2	10 1/2	PC	Mo	Zen	P	Se	DR	P	OW	Own	Own	Own	FM	600	D	FX	126	84	34	48x4	52x4					
49677	4.5	440	60.0	130-1900	L	C	7-3 1/2	10 1/2	PC	Mo	Zen	P	Se	DR	P	OW	Own	Own	Own	FM	600	D	FX	126	84	34	48x4	52x4					
50600	4.8	150	29.0	54-2100	L	C	8-7 1/2	10 1/2	FP	No	Zen	V	DR	DR	P	OW	Own	Own	Own	FM	600	D	FX	126	84	34	48x4	52x4					
51260	4.8	150	29.0	54-2100	L	C	8-7 1/2	10 1/2	FP	No	Zen	V	DR	DR	P	OW	Own	Own	Own	FM	600	D	FX	126	84	34	48x4	52x4					
52260	4.8	150	29.0	54-2100	L	C	8-7 1/2	10 1/2	FP	No	Zen	V	DR	DR	P	OW	Own	Own	Own	FM	600	D	FX	126	84	34	48x4	52x4					
53260	4.8	150	29.0	54-2100	L	C																											

Line Number	MAKE AND MODEL	Wheels Driven—6-Wheelers	GENERAL (See Keynote)				TIRE SIZE		MAJOR UNITS				FRAME							
			Tonnage Rating	Chassis Price	Standard Wheelbase	Max. W. B. Furnished	Gross Vehicle Weight	Chassis Wt. (Stripped)	Front	Rear	ENGINE	TRANSMISSION	REAR AXLE	GEAR RATIOS	Side Rail Dimensions	Type				
1	Hendricks'n36D (conc'd), 38D	4R	5-12	6600	Op	Op	32500	11200	B9.00/20	DB9.00/20	Wau 6-125	6-4 1/2 x 5 1/2	Fu VU	U 5	No	Own 2513X	2B	A Opt	Opt 8x3x 1/2	P
2	44D	4R	12	8000	Op	Op	40000	13200	B9.75/20	DB9.75/20	Wau 6SRK	6-4 1/2 x 5 1/2	BL 60-7	A 7	No	Eat 44000	2F	A Opt	Opt 8x3x 1/2	P
3	Hug.	99	4R	1030	148	148	58500	15100	S36x8	S40x16	Bud GF6	6-4 1/2 x 6	BL 714-703	U 4	A 3	Wis SD410W	2F	R 10.3	139 9x4 1/2 x 1 1/2	I
4	Ind. 95SBT-151	2C	10	1675	168	186	20000	5500	P32x6	DP32x6	Her JXC	6-3 1/2 x 4 1/2	BL 224	U 4	No	Tim SBT151	SF	T 7.4	45.8 7 1/2 x 2 1/2 x 1 1/2	C
5	95SW 75	4R	10	1735	168	186	20000	5800	P32x6	DP32x6	Her JXC	6-3 1/2 x 4 1/2	BL 224	U 4	No	Tim SW75	WF	T 7.4	45.8 7 1/2 x 2 1/2 x 1 1/2	I
6	17SBT251	2C	10	3250	188	212	24000	8500	P34x7	DP34x7	Her YXC	6-4 1/2 x 5 1/2	BL 334	U 4	Op	Tim SBT251	BF	R 6.1	37.8 8 1/2 x 3 1/2 x 1 1/2	TL
7	17SW251	4R	10	3475	188	224	28000	9000	P34x7	DP34x7	Her YXC	6-4 1/2 x 5 1/2	BL 334	U 4	Op	Tim SW251	WF	R 6.2	38.1 8 1/2 x 3 1/2 x 1 1/2	TL
8	106SW-151	4R	10	2675	188	212	24000	7500	P32x6	DP32x6	Her WXC	6-4 1/2 x 4 1/2	BL 324	U 4	No	Tim SW151	WF	R 6.4	42.6 8x3x 1/2	T
9	Ken.	186SDT	2C	6450	205	235	38000	10500	B9.00/20	DB9.00/20	Her YXC2	6-4 1/2 x 4 1/2	BL 1554	U 4	A 3	Tim Sdt310W	2F	H 7.33	104. 9x3x 1/2	T
10	241SDT	2C	10	6850	205	235	40500	11000	B9.00/20	DB9.00/20	Her RXB	6-4 1/2 x 5 1/2	BL 714	U 4	A 3	Tim Sdt310W	2F	H 7.33	85.5 9x3x 1/2	T
11	346A	4R	10	8800	210	240	40500	13000	B9.75/20	DB9.75/20	Has 160	6-4 1/2 x 5 1/2	BL 714	U 4	A 3	Tim 310W	WF	H 7.25	84.5 8x3x 1/2	C
12	346B	4R	10	8550	210	240	40500	13000	B9.75/20	DB9.75/20	Bud GF-6	6-4 1/2 x 6	BL 714	U 4	A 3	Tim 310W	WF	H 7.25	98.4 8x3x 1/2	C
13	346C	4R	10	9500	210	240	40500	14000	B9.75/20	DB9.75/20	Has 175	6-5 x 6	BL 714	U 4	A 3	Tim 310W	WF	H 7.25	98.4 8x3x 1/2	C
14	386C	4R	10	10200	210	240	50100	14500	B9.75/20	DB9.75/20	Has 175	6-5 x 6	BL 714	U 4	A 3	Tim SW410W	WF	H 7.60	103. 8x3x 1/2	C
15	Kleiber	280	4R	6000	201	210	28000	10060	B9.00/20	DB9.00/20	Con 20R	6-4 1/2 x 4 1/2	BL 714-60	A 7	A 7	Tim Sw200W	WF	R 7.75	73.6 7x3 1/2 x 1 1/2	P
16	340	4R	10	7000	210	215	34000	11900	B9.75/20	DB9.75/20	Con 21R	6-4 1/2 x 5 1/2	BL 714-60	A 7	A 3	Tim Sw300W	WF	R 9.33	88.6 8x3x 1/2	P
17	340T	4R	10	8000	215	225	34000	13650	B9.75/20	DB9.75/20	Con 22R	6-4 1/2 x 5 1/2	BL 714-60	A 7	A 3	Tim Sw400W	WF	R 10.3	98.1 8x3x 1/2	P
18	La Fran-R.	Q6	4R	11605	216	260	40000	14900	B10.50/20	DB10.50/20	Own 312B	12-4x5	BL 714	U 4	No	Tim SWD410W	WF	Opt	12x3 1/2 x 1 1/2	C
19	LeMoon(9)	701	4R	4475	187	199	25500	8500	B8.25/20	DB8.25/20	Lye AEC	8-3 1/2 x 4 1/2	Fu VUOG	U 5	No	Ti 63703-97H	WF	R 6.20	43.8 7x4x 1/2	B
20	801	4R	6-7	5100	187	199	32500	9720	B9.00/20	DB9.00/20	Lye AEC	8-3 1/2 x 4 1/2	Fu VUOG	U 5	No	Ti 65703-97H	WF	H 6.75	47.7 7x4x 1/2	B
21	802	4R	6-7	5350	187	199	32500	9800	B9.00/20	DB9.00/20	Wau 6SRL	6-4 1/2 x 5 1/2	Fu VUOG	U 5	No	T66703-97W	WF	H 6.75	47.7 7x4x 1/2	B
22	900	4R	7-8	6775	191	203	36000	12000	B9.75/20	DB9.75/20	Wau 6SRL	6-4 1/2 x 5 1/2	BL 607	A 7	No	Tim SW310W	WF	H 9.25	86.9 9x4x 1/2	B
23	1000	4R	8-10	7950	196	208	40000	12600	B9.75/24	DB9.75/24	Wau 6AB	6-4 1/2 x 5 1/2	BL 714	U 4	3	Tim SW310W	WF	H 9.25	128. 9x4x 1/2	B
24	1200	4R	10-12	8500	196	208	40000	14000	B9.75/24	DB9.75/24	Wau 6RB	6-5 x 5 1/2	BL 714	U 4	3	Tim SW410W	WF	H 9.25	128. 9x4x 1/2	B
25	1200D	4R	10-12	9750	196	208	40000	14000	B9.75/24	DB9.75/24	Cum. Die H6	6-4 1/2 x 6	BL 735	U 5	No	Tim SW410W	WF	H 7.6	47.6 9x4x 1/2	B
26	Mack	SW86	4R	9000	216	260	38700	12850	B10.50/20	DB10.50/20	Her RXCP	6-4 1/2 x 5 1/2	BL 615	A 5	No	Tim spec.	WF	W 4	9.0 59. 12x3x 1/2	T
27	BQ	4R	10-12	8150	178	207	35400	12000	B8.25/22	DB8.25/22	Own BX	6-4 1/2 x 5 1/2	Own BX	U 4	No	Own BX6	2F	A 6.53	46.0 9 1/2 x 3 1/2	C
28	BQ	4R	10-12	9350	224	248	41500	15000	B9.75/22	DB9.75/22	Own BQ	6-4 1/2 x 5 1/2	Own BQ	A 4	No	Own BX6	2F	R 6.54	41.9 10 1/2 x 3 1/2	C
29	AC	4R	8-15	8500	217	257	50500	14550	P40x8	DP40x8	Own BQ	6-4 1/2 x 5 1/2	Own AC	J 4	No	Own AC	CD	R 9.26	59.4 8x3x 1/2	C
30	AC	4R	8-15	9000	217	257	50500	15900	B9.75/22	DB9.75/22	Own BQ	6-4 1/2 x 5 1/2	Own AC	A 4	No	Own AK6	2F	A 7.46	47.8 8 1/2 x 3 1/2	C
31	AP	4R	8-15	10500	217	257	51000	14850	P40x8	DP40x8	Own AP	6-5 x 6	Own AC	J 4	No	Own AP	CD	R 9.26	59.4 8x3x 1/2	C
32	AP	4R	8-15	11000	217	257	50500	16400	B9.75/22	DB9.75/22	Own AP	6-5 x 6	Own AC	A 4	No	Own AK6	2F	A 7.46	47.8 8 1/2 x 3 1/2	C
33	Mar-Herr.	TH310A-6	7 1/2-10	10000	191	229	34070	13800	B9.75/22	DB9.75/22	Her RXC	6-4 1/2 x 5 1/2	Fu VUOG	U 5	A 2	Wis SD310W	2F	R 9.11	164. 8 1/2 x 3 1/2	P
34	TH320	6-10-12	10	15000	225	255	43075	18000	B10.50/22	DB10.50/22	Her HXB	6-5 x 6	BL 724	U 4	A 3	Wis SD420A	2F	R 9.11	189. 10 1/2 x 3 1/2	P
35	TH330-6	12-15	17500	225	255	50130	20100	B11.25/24	DB11.25/24	Her HXD	6-5 x 6	BL 734	U 4	A 3	Wis SD510	2F	R 10.2	189. 10 1/2 x 3 1/2	P	
36	Mo'd.	RA-15	4	1550	170	Op	15500	5300	B8.50/20	DB8.50/20	Her JXC	6-3 1/2 x 4 1/2	BL 224	U 4	No	Tim SBT75	SF	R 5.66	35.0 7 1/2 x 2 1/2 x 1 1/2	T
37	RA20	2C	5-5 1/2	1985	184	Op	20000	6350	P32x6	DP32x6	Her JXC	6-3 1/2 x 4 1/2	BL 224	U 4	No	Tim SBT151	SF	R 6.16	38.2 9 1/2 x 3 1/2	T
38	P.A.	34L50184	4R	6600	200	240	34000	13200	B9.75/20	DB9.75/20	Her RXB	6-4 1/2 x 5 1/2	Co TNU	U 4	Op	Tim SW310	W	A 9.25	49.0 10x3x 1/2	C
39	34K61184	4R	10	7200	180	240	34000	14200	B9.75/20	DB9.75/20	Her GXA	6-4 1/2 x 5 1/2	Own618290	U 4	Op	Tim SW310	W	A 7.75	40.6 10x3x 1/2	C
40	44K77984	4R	10	7500	180	200	44000	14500	B10.50/20	DB10.50/20	Her HXA	6-5 x 6	Own618290	U 4	Op	Tim SW410	W	A 7.75	40.6 10x3x 1/2	C
41	Relay	608W	2R	4550	126	161	20000	12000	P30x8	DP30x8	Bud B46	6-4 1/2 x 5 1/2	Fu VU16	U 5	No	Own 60	2R	R 9.09	63.6 8 1/2 x 3 1/2 x 1 1/2	P
42	Sterling	FBT152	2R	4550	174	204	30400	9500	B9.00/20	DB9.00/20	Wau 6-110	6-4 1/2 x 4 1/2	Own UC7	U 5	No	Own	2F	R 7.8	55.5 10x3 1/2 x 1 1/2	L
43	FDT152	2R	8 1/2	4705	174	204	30400	9700	B9.00/20	DB9.00/20	Wau 6-110	6-4 1/2 x 4 1/2	Own UC7	U 5	No	Own	2F	R 7.8	55.5 10x3 1/2 x 1 1/2	L
44	FDS180	4R	8-10	8925	158	Op	36000	12850	P40x8	DP40x8	Wau AB	6-4 1/2 x 5 1/2	Own UC8	U 4	A 3	Tim 310	2F	R 9.1	112. 15x3 1/2 x 1 1/2	L
45	FDS200	4R	10-12	9510	159	Op	40000	13550	P40x8	DP40x8	Wau RB	6-5 x 5 1/2	Own UC8	U 4	A 3	Tim 410	2F	R 9.1	113. 15x3 1/2 x 1 1/2	L
46	FCS210	4R	15-18	10825	Op	Op	42000	14750	P40x8	DP40x8	Wau RB	6-5 x 5 1/2	Own UC8	U 4	A 3	Own	CD	R 9.5	59.6 15x3 1/2 x 1 1/2	L
47	FDT200	2R	12-12 1/2	7670	178	208	40000	12050	P40x8	DP40x8	Wau 6-125	6-4 1/2 x 5 1/2	Own UC2	U 4	Op	Own	2F	R 8.85	58.8 12x3 1/2 x 1 1/2	L
48	FDT250	2R	16-16 1/2	8555	186	216	50000	13550	P42x9	DP42x9	Wau RB	6-5 x 5 1/2	Own UC8	U 4	Op	Own	2F	R 8.85	58.8 12x3 1/2 x 1 1/2	L
49	FCT180	2R	10-10 1/2	7265	178	208	36000	11200	P36x8	DP36x8	Wau SRL	6-4 1/2 x 5 1/2	Own UC2	U 4	Op	Own	CD	R 8.2	54.5 12x3 1/2 x 1 1/2	L
50	FCT200	2R	12-12 1/2	7685	178	208	40000	11800	P40x8	DP40x8	Wau 6-125	6-4 1/2 x 5 1/2	Own UC2	U 4	Op	Own	CD	R 9.3	61.8 12x3 1/2 x 1 1/2	L
51	Wht. 630SW200	4R	5-6	6245	193	205	10000	B8.25/20	DB8.25/20	Own 3AD	6-4 x 5 1/2	Own 4B	U 4	No	Tim SW200H	WF	R 6.75	44.2 8 1/2 x 3 1/2 x 1 1/2	C	
52	642SW320	4R	7-9	8025	198	210	12670	B9.00/20	DB9.00/20	Own 1AB	6-4 1/2 x 5 1/2	Own 7B	U 4	No	Tim SW310W	WF	R 8.5	55.6 8 1/2 x 3 1/2 x 1 1/2	C	
53	643SW420	4R	9-11	8550	198	215	14400	P40x8	DP40x8	Own 1AB	6-4 1/2 x 5 1/2	Own 7B	U 4	No	Tim SW410W	WF	R 10.2	69. 18 1/2 x 3 1/2 x 1 1/2	C	

KEY TO ABBREVIATIONS AND REFERENCE MARKS

GENERAL

Chassis Price—Chassis price quoted applies to the standard wheelbase and specifications listed. All prices are F.O.B. factory.

Tonnage Rating—Where a spread of ratings is given the maximum ratings are for ideal operating conditions and the minimum for extremely difficult conditions; the ranges between are for varying operating conditions.

Gross Vehicle Weight—Is chassis weight, plus body and cab, plus payload. Gross vehicle weight given for a model is based on maximum recommended tire size and not on tires listed as standard equipment.

Chassis Weight Stripped—Includes gas, oil and water and all things included in chassis price. Does not include the weight of cab.

Line Number	ENGINE DETAILS										FUEL SYST.	ELEC-TRICAL	FRONT AXLE	BRAKES	BODY MOUNT-ING DATA		SPRINGS		Auxiliary Type															
	Piston Displacement	Compression Ratio	Torque lb. ft.	N.A.C.C. Rated H.P.	Max. Brake H.P. at R.P.M. Given	Valve Arrangement	Camshaft Drive	MAIN BEARINGS		Oiling System Type					Governor Make	Carburetors Make	Fuel Feed	Ignition System Make		Generator, Starter Make	Clutch Type and Make	Radiator Make	Universals Make	Make and Model	Steering Gear Make	SERVICE		Hand Type, Location	Cab to Rear of Frame	Cab to Rear Axle	Width of Frame	Front	Rear	
								Piston Material	Number and Diameter		Length	Make, Location, Operation	Lining Area	Drum Material																				
1462	4.6	324	45.9	125	2600	F	L	F	C	7-3	13 1/2	PC	Wa	Zen	M	AL	AL	D	Fu	Ch	Blo	Tim 27450	Ros	L41HV	504	G	TD	Opt	Opt	34	40 1/2 x 3 1/2	35 1/2 x 4	N	
2157	4.6	330	51.2	110	2000	F	L	L	C	7-3	13 1/2	PC	Wa	Zen	M	AL	AL	D	BL	Ch	Blo	Tim 27450	Ros	W841A	780	G	TX	Opt	Opt	36	40 1/2 x 3 1/2	66x4	N	
677	4.7	140	50.1	126	1850	L	L	L	C	4-3 1/2	10 1/2	PC	Pe	Zen	M	RB	No	dp	BL	Yo	Blo	Shu 715-11	Ros	W841A	780	G	TX	Opt	Opt	36	41 3/4 x 3	53x4	N	
438	4.3	410	54.1	126	1850	L	L	L	C	4-3 1/2	10 1/2	PC	No	Str	M	AL	AL	P	BL	Yo	Spl	Tim 31020	Ros	L61HV	559	G	TX	140	83	34	37x2 1/2	52x4	N	
282	5.3	186	33.7	73	2800	L	L	L	C	A	7-2 1/2	10 1/2	PC	No	Str	M	AL	AL	P	BL	Yo	Spl	Tim 31020	Ros	L61HV	459	G	TX	140	83	34	37x2 1/2	44x3	N
428	4.4	283	45.9	94	2200	L	L	L	C	A	7-3	14	PC	Ha	Str	M	AL	AL	P	BL	Yo	Spl	Shu 5582B	Ros	L61HV	625	G	CD	168	101	34 1/2	40x2 1/2	52x4	N
939	4.7	216	38.4	76	2400	L	L	L	C	A	7-3	14	PC	Ha	Str	M	AL	AL	P	BL	Yo	Spl	Shu 5572	Ros	L61HV	559	G	CD	168	101 1/2	34 1/2	39 1/2 x 2 1/2	52x4	N
1045	4.7	300	45.9	98	2200	L	L	L	C	A	7-3	14	PC	Ha	Str	M	AL	AL	P	BL	Yo	Spl	Tim 35000N	Ros	W841A	815	a	FD	192	120	33 1/2	42x3	56x4	N
1150	4.9	330	48.6	110	2200	L	L	L	C	A	7-3	14	PC	Ha	Str	M	AL	AL	P	BL	Yo	Spl	Tim 36020N	Ros	W841A	815	a	FD	192	120	33 1/2	42x3	56x4	N
1498	4.4	322	43.3	125	2400	L	L	L	C	A	4-2 1/2	10 1/2	FP	No	Zen	M	DR	DR	P	BL	Pe	Spl	Tim 36020N	Ros	W841A	815	a	FD	192	120	33 1/2	42x3	56x4	N
1338	4.3	410	54.1	126	1850	L	L	L	C	A	3-3	10 1/2	CC	Bu	Zen	M	DR	DR	P	BL	Pe	Spl	Tim 36020N	Ros	W841A	815	a	FD	192	120	33 1/2	42x3	56x4	N
1407	4.4	506	60.0	170	2000	H	H	H	C	A	7-3 1/2	11 1/2	FF	HS	Zen	M	DR	DR	P	BL	Pe	Spl	Tim 36020N	Ros	W841A	815	a	FD	192	120	33 1/2	42x3	56x4	N
1707	4.4	506	60.0	170	2000	H	H	H	C	A	7-3 1/2	11 1/2	FF	HS	Zen	M	DR	DR	P	BL	Pe	Spl	Tim 36020N	Ros	W841A	815	a	FD	192	120	33 1/2	42x3	56x4	N
1411	4.2	236	40.0	89	2400	H	H	H	C	A	7-3	13 1/2	FP	No	Str	V	RB	DR	D	BL	OW	Spl	Tim 16302	Ros	T41A	848	G	TD	180	130	38	44x3	60x4	N
1727	4.2	236	40.0	89	2400	H	H	H	C	A	7-3	13 1/2	FP	No	Str	V	RB	DR	D	BL	OW	Spl	Tim 16302	Ros	T41A	848	G	TD	180	130	38	44x3	60x4	N
1638	4.2	236	40.0	89	2400	H	H	H	C	A	7-3	13 1/2	FP	No	Str	V	RB	DR	D	BL	OW	Spl	Tim 17300	Ros	T41A	848	G	TD	204	130	38	44x3	60x4	N
1754	5.1	510	76.7	240	2900	H	C	C	A	4-3 1/2	10	PC	No	Zen	M	DR	DR	dp	Lo	OW	Blo	Tim 27450TW	Ros	W861A	782	D	CD	111 1/2	216	34	44x3	None	N	
20420	5.2	300	44.4	130	2800	L	L	L	C	5-2 1/2	12 1/2	FP	Ha	Str	M	DR	DR	D	Fu	Ch	Spl	Tim 35000H	Ros	L61HV	525	a	CD	162	108	34	39x2 1/2	39x2 1/2	N	
21420	5.2	300	44.4	130	2800	L	L	L	C	5-2 1/2	12 1/2	FP	Ha	Str	M	DR	DR	D	Fu	Ch	Spl	Tim 35000H	Ros	L61HV	633	a	CD	162	108	34	39x2 1/2	46x3 1/2	N	
2462	4.5	300	45.9	98	2000	L	L	L	C	A	7-3	13 1/2	PC	Wa	Str	M	AL	DR	D	Fu	Ch	Spl	Tim 35000TW	Ros	W861A	711	a	CD	162	108	34	39x2 1/2	46x3 1/2	N
22462	4.5	300	45.9	98	2000	L	L	L	C	A	7-3	13 1/2	PC	Wa	Str	M	AL	DR	D	Fu	Ch	Spl	Tim 26045TW	Ros	W861A	966	a	CD	162	108	34	48x3 1/2	53x4	N
24549	4.5	332	48.6	100	2000	L	L	L	C	A	4-3 1/2	11 1/2	PC	Wa	Str	M	AL	LN	D	BL	Ch	Spl	Tim 26045TW	Ros	W861A	966	a	CD	162	108	34	48x3 1/2	53x4	N
25672	4.6	460	60.0	127	2000	L	L	L	C	A	4-3 1/2	11 1/2	PC	Wa	Str	M	AL	LN	D	BL	Ch	Spl	Tim 27045TW	Ros	W841A	792	a	CD	162	108	34	48x3 1/2	53x4	N
26672	4.6	460	60.0	127	2000	L	L	L	C	A	4-3 1/2	11 1/2	PC	Wa	Str	M	AL	LN	D	BL	Ch	Spl	Tim 27045TW	Ros	W861A	966	a	CD	162	108	34	48x3 1/2	53x4	N
27529	4.9	350	51.2	112	2000	L	L	L	C	A	7-3	14	PC	Ha	Str	M	DR	DR	D	BL	Pe	Spl	Tim 26450TW	Ros	W861A	1151	a	TD	198	116	33	42x3	None	N
28468	4.7	292	43.4	104	2300	L	L	L	C	A	7-3	13 1/2	FP	Ha	Str	M	NE	P	OWN	OW	Spl	Own BX	Ros	O61A	1118	a	FD	192	109	33 1/2	54 1/2 x 3	48x3 1/2	N	
29611	5.0	398	54.2	128	2200	L	L	L	C	A	3-3 1/2	11 1/2	PS	OW	Str	M	RB	NE	P	OW	Cle	Own BQ	Ros	O61A	902	a	FD	192	111	33 1/2	50x3 1/2	48x3 1/2	N	
30611	5.0	398	54.2	128	2200	L	L	L	C	A	3-3 1/2	11 1/2	PS	OW	Str	M	RB	NE	P	OW	Cle	Own AK	Ros	O61A	1052	a	FD	180	109	37	48x3 1/2	52x4	N	
31611	5.0	398	54.2	128	2200	L	L	L	C	A	3-3 1/2	11 1/2	PS	OW	Str	M	RB	NE	P	OW	Cle	Own AK	Ros	O61A	1052	a	FD	180	109	37	48x3 1/2	52x4	N	
32706	4.8	427	60.0	138	1900	L	L	L	C	A	3-3 1/2	11 1/2	PS	OW	Str	G	RB	LN	P	OW	OW	Own AK	Ros	O61A	1052	a	FD	180	109	37	46 1/2 x 3 1/2	52x4	N	
33706	4.8	427	60.0	138	1900	L	L	L	C	A	3-3 1/2	11 1/2	PS	OW	Str	G	RB	LN	P	OW	OW	Own AK	Ros	O61A	1044	a	FD	180	109	37	46 1/2 x 3 1/2	52x4	N	
34529	4.9	350	51.2	112	2200	L	L	L	C	A	7-3	15	PC	Ha	Zen	M	DR	DR	D	Fu	Yo	Blo	Own 3	Ros	W82/41A	1836	a	FD	Opt	98	34	44x3	52x3 1/2	N
35707	4.5	455	60.0	150	2000	L	L	L	C	A	7-3 1/2	17	PC	Ha	Zen	M	DR	DR	dp	BL	Yo	Blo	Own 3A	Ros	W82/41A	1948	a	FD	Opt	128	34	52x4	54x4	N
36855	4.5	550	72.8	180	2000	L	L	L	C	A	7-3 1/2	17	PC	Ha	Zen	M	DR	DR	dp	BL	Yo	Blo	Own 4	Ros	W82/41A	1948	a	FD	Opt	128	34	52x4	54x4	N
37282	5.0	176	33.8	73	2800	L	L	L	C	A	7-3	10 1/2	PC	No	Zen	M	AL	AL	P	BL	Lo	Spl	Tim 30000H	Ros	L61HV	596	a	FD	180	90	34	40x2 1/2	44x3	N
38282	5.0	176	33.8	73	2800	L	L	L	C	A	7-3	10 1/2	PC	No	Zen	M	AL	AL	P	BL	Lo	Spl	Tim 31000H	Ros	L61HV	570	a	FD	168	102	34	40x2 1/2	52x4	N
39501	4.6	330	48.6	110	2200	L	L	L	C	A	7-3	12 1/2	PC	Ha	Zen	M	DR	DR	P	Lo	Lo	Cle	Tim 27050	Ha	T61A	940	D	TX	180 1/2	118 1/2	34	41x3	56x4	N
40611	4.5	410	54.1	130	2000	L	L	L	C	A	7-3 1/2	16 1/2	PC	Ha	Str	M	DR	DR	P	Lo	Lo	Spl	Tim 27050	Ros	T61A	940	D	TX	180 1/2	112 1/2	34	41x3	56x4	N
41779	4.5	510	66.1	130	1800	L	L	L	C	A	7-3 1/2	16 1/2	PC	Ha	Str	M	DR	DR	P	Lo	Lo	Spl	Tim 27050	Ros	T61A	940	D	TX	180 1/2	112 1/2	34	41x3	56x4	N
42411	4.5	520	40.8	83	2100	L	L	L	C	A	2-1/2	12 1/2	FP	Bu	Zen	V	AL	AL	D	Fu	Lo	Blo	Tim 35000H	Ha	L41HV	744	P	FX	216	126 1/2	34	42x2 1/2	58x3	N
43358	5.0	254	38.5	110	2800	F	F	F	C	A	7-2 1/2	12 1/2	CC	Ha	Zen	M	DR	DR	D	OW	Mo	Spl	Tim 35000N	Ros	L41HV	596	a	CD	192	91	34	42x2 1/2	57x4	N
44358	5.0	254	38.5	110	2800	F	F	F	C	A	7-2 1/2	12 1/2	CC	Ha	Zen	M	DR	DR	D	OW	Mo	Spl	Tim 35000N	Ros	L41HV	596	a	CD	192	91	34	42x2 1/2	57x4	N
45349	4.5	330	48.6	99	2000	L	L	L	C	A	3-3 1/2	11 1/2	CC	Ha	Zen	M	DR	DR	D	OW	Mo	Spl	Tim 26450N	Ros	W841A	576	a	CD	Opt					

Coordination of Transport Services As It Stands Today

CONTINUED FROM PAGE 13

tal stock of which is owned entirely by railroad companies of the U.S.

Coordinated motor-rail freight transportation services divide into two principal classes: all coordinated line-haul services, and coordinated terminal services.

A number of railroads have established coordinated motor and railroad freight transportation in their line-haul services in order to improve the speed of transportation, to reduce the cost of certain types of transport services, to render more flexible services or to serve territories which cannot be served with railroad facilities.

Motor truck services are used by a number of railroad lines to improve the operation of local way-freight trains. These trains were once stopped at each local station along the divisions over which they operated in order to deliver and pick-up a small number of consignments of less-than-carload freight at each local station. One of the most important examples of this type of coordinated motor-rail line-haul transportation is the use of motor truck service to supplement way-freight train service by the Pennsylvania. On one division of that road, way-freight trains are stopped at zone-stations only where all outbound shipments and inbound shipments from or to other stations in each zone are picked up or delivered by the way-freight trains, and the shipments are transported to or from the other stations in the respective zones by motor trucks operated by motor haulage companies acting as agent of the railroad company. This plan of operation has improved the railroad freight service materially by eliminating the interference of the way trains, which formerly made stops at stations every mile or so along the line, with passenger and freight trains that now make only a few stops at the zone stations, thereby reducing the running time of such trains to a fraction of the former operating schedule.

Another important type of coordinated line-haul motor-rail freight service is the "Blue Streak" freight service offered by the St. Louis-Southwestern Railway Lines, usually known as the Cotton-Belt System, between St. Louis, Missouri, and points in the Southwest. Specially inspected railroad freight cars and fast passenger locomotives are used on the "Blue Streak." The train is scheduled to leave St. Louis at 5.30 P.M. each day and to arrive at Shreveport, La., the next morning at 11.50 A.M. The distance between these cities is 592 miles. Stops are made at intermediate points, such as Jonesboro, Stuttgart, Pine Bluff, Little Rock, and Camden, Arkansas; and at Texarkana, Texas, where motor trucks complete this high-speed transportation service.

The "Ferry Truck" service of the

Chicago, North Shore and Milwaukee Railroad is another interesting and important type of coordinated railroad and motor freight service. This railroad owns trailers which are placed by tractors at the warehouses of shippers to be loaded with less-than-carload freight shipments. When loaded, the trailers are conveyed by tractors to the railroad stations, where the vehicles are run on their own wheels aboard railroad flat cars, which are equipped with clamps to hold the trailers in place during the railroad journey. At destination, the trailers are run off the railroad flat cars and conveyed to the warehouses of consignees by tractors.

Somewhat similar to the "ferry-truck" service, is the service offered by several eastern railroads, including the Pennsylvania Railroad, collectively known as "Truck-Body" services. Under this arrangement, demountable truck bodies are loaded at the warehouses of shippers or at the stations of motor haulage companies with merchandise freight of any kind. After being loaded, the demountable truck bodies are placed upon motor truck chassis and conveyed to railroad stations, where the truck-bodies are lifted by crane conveyors to railroad gondola cars. The bodies are transported by railroad to destination, where they are lifted from the railroad cars and placed upon truck chassis to be hauled to the warehouses of the consignees.

Akin to the "truck-body" and "ferry-truck" "truck" services are the "container-car" services which have been the objects of high hopes and acrimonious discussion for the past ten years. The containers are designed for use as interchangeable equipment between railroads and motor trucks. The freight is loaded into the containers by individual shippers at their places of business or by freight forwarding companies at their concentration stations, to be hauled by motor truck to the railroad freight stations. Here the containers are hoisted by cranes to railroad cars, of the gondola or flat types, especially equipped to receive batteries of containers. At destination, the containers are lifted from cars by cranes or transferred from the railroad cars to motor trucks or station platforms for delivery to the distribution stations of the freight forwarding companies or to the places of business of the consignees. Container car service has been of greatest usefulness to the freight forwarders.

Another type of coordination which is not as a rule considered when plans of railroad and motor freight coordination are discussed, is the coordinated service offered shippers and consignees by the freight forwarding companies. These companies act as intercepting agents who collect small less-than-carload shipments from shippers, truck the shipments to concentration stations connected with railroad lines, load the shipments into classified carload lots or into container lots, for-

ward the shipment by railroad to their destination distribution centers, and distribute the consignments to their intended consignees by local motor trucking or short-haul highway motor freight services.

The coordination of railroad and motor transportation is also found in various parts of the United States where motor vehicles are used to replace railroad services upon branch lines where the volume of traffic is so light as not to justify the costs of operating railroad train services.

Motor vehicles are also used in coordinated line haul service to connect disconnected lines of railroad or to serve "cross-country" routes between railroad lines or divisions, where the distances are unduly long by all-rail routes, or when traffic can be kept out of congested areas by the use of "cross-country" highway routes.

A number of railroads operate, usually through subsidiary motor transportation companies, all-highway transportation services. The vehicles used in these services are often included in the census figures purporting to show the extent of coordination of motor-and-rail transportation facilities. These all-highway services are not coordinated but directly competitive services. They are no more coordinated services than if motor transportation companies bought railroad properties and entered the railroad business.

Now we may turn for even a briefer listing of the ways in which motor vehicles are used in coordinated terminal services. Motor vehicles are used either by railroad, steamship or other line-haul carriers in a great variety of ways to perform various kinds of terminal services. These terminal services may be performed by motor vehicles owned by other types of carriers, by vehicles owned and operated by subsidiary companies, by vehicles owned and operated by agency motor transport carriers, or by motor carriers acting as participating carriers in joint route and rate arrangements.

Types of coordinated rail-and-motor terminal coordinated services include:

First: The use of motor truck service in lieu of lighterage and carfloatage services, as is done by the railroads serving New York, through the use of agency motor haulage companies, where motor trucks are used to transport freight between the railhead stations on the Jersey side of the New York Harbor to "inland" stations on Manhattan Island and Long Island, in place of lighters and carfloats and pier stations.

Second: The extension of railroad services to stations not connected with railroad tracks, through the use of the cartage vehicles of motor transport agents to enable the railroads to serve shippers and consignees located at points not served by the railroads, such as the terminal cartage service between the railroad freight stations at East St. Louis, Ill., and the universal "off-track" stations of the Columbia Motor Terminals Co. at St. Louis, Mo.

Third: The use of motor trucks in railroad trap or ferry car services between railroad stations and industrial plants, to replace railroad freight cars, the carrying capacities of which are unnecessarily large, and to avoid circuitous movements via rail between railroad stations and industrial shippers and consignees.

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Viscosity Change in a Perfect Engine Reflects Oil Quality

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oil was then placed in turn in the engine and used for about 1000 miles, at which point the oil was drained and tested for viscosity and general condition. Oil A, in chart 1, curve 1, was used for reference because it was known to be an oil of very high quality. The first test run checked the mechanical and operating conditions of the engine and the slight increase in viscosity of this oil confirmed the assumption that the oil was of high quality and the engine in excellent mechanical condition.

The second run, using oil B, showed an increase in viscosity from an S.A.E. 30 to almost S.A.E. 40. The oil when drained was much blacker than oil A and was slightly contaminated with sludge and free carbon particles indicating a decomposition of the oil in service. The action of oil B in this test indicates that it contained a higher percentage of light oil and a corresponding higher percentage of heavy oils than oil A because both had same initial viscosity.

Oil C was still worse. At the end of its test run viscosity had increased from S.A.E. 30 to more than 50. When drained, it was badly fouled with sludge and free carbon particles and of a thick, tarry nature. There could be no doubt about the relative lubricating value of oil C as it came out of the crankcase and oil A as it was drained.

At the end of the third test the engine crankcase was thoroughly flushed out with reference oil A, the spark plugs were cleaned and reference oil A was put in for a test run of 1000 miles to check any possible change in the engine. When oil was drained, it was found to have increased its viscosity about the same as in the first test but it was slightly contaminated with sludge which was no doubt carried over from the test run with oil C.

Test run 5 was with oil D which showed greater increase in viscosity than oil B but less than oil C. Oils B and C were then repeated, following which oil B was given a third test and the final test run was with the reference oil A. There is some variation in second test runs with oil, as B and C, but general agreement in result.

When oils of entirely too high viscosity are used in an engine, the change in viscosity of a poor oil is not much different than the change in viscosity of a good oil. This is shown in the tests illustrated on the upper curve in chart 1. Both oils were of approximately S.A.E. 60 viscosity, entirely too high for this engine. Oil A sells for approximately three times as much as oil B. Oil A was used for 4000 miles, being drained and viscosity determined each 1000 miles, and oil C was used for about 5000 miles with draining and testing every 1000 miles. After running the test on

the A oil new piston rings were installed, carbon cleaned and valves ground before the test on oil C.

In both cases there was a slight increase in viscosity, after which there was dilution. There was considerable trouble in maintaining the plugs at full efficiency, no doubt because they were being fouled and subjected to high temperature. The tendency toward crankcase dilution may be accounted for by sticky valves and the sludge trouble. The C oil at draining period had a higher percentage of insoluble sludge and free carbon but otherwise there was very little difference in the action of the two oils. This and other experiments seem to indicate that when oils of excessively high viscosity are incorrectly used in engines, the cost of the respective oil is unimportant so far as lubrication is concerned.

We conducted an experiment which checked both oil and engine and the change in viscosity was found to be entirely in accord with the tests in actual operation reported in this and the preceding article. During the experiment, shown in chart No. 2, we tested viscosity at several points, without draining the oil, in order to get a closer check on viscosity of the oil in the crankcase. At the start of the test the crankcase was filled with an oil equivalent to S.A.E. 40 viscosity which we compounded from a heavy S.A.E. 70 oil and the very light oil recovered from an oil reclaimer, frequently called penetrating oil. A test at the end of 500 miles of operation showed viscosity more than S.A.E. 60, and when the oil was drained at 1000 miles it had become almost equal in viscosity to S.A.E. 70, which was the same as the original oil. During this test run it was necessary to add a few extra quarts of the S.A.E. 70 oil but this did not have any appreciable effect on results. Fresh oil of S.A.E. 70 viscosity was put in the crankcase and an old set of spark plugs were installed and the carburetor was adjusted for a rich mixture. At the end of 500 miles viscosity was down to about 50. At this point the carburetor was cut down a trifle and at the end of 1000 miles test run the viscosity was down to almost 40. It was not necessary to add any more oil during this test run and the oil level was practically the same at the end of the test as at the beginning.

At this point, the start of run three, the carburetor was properly adjusted to its original setting, new spark plugs were installed and an S.A.E. 40 oil was used in the crankcase. During this period there was an increase in viscosity to 45. At the start of run four, the old spark plugs were put back and the carburetor reset for a rich mixture and the crankcase was again filled with new oil of S.A.E. 40 viscosity. At the end of 1000 miles viscosity was down below S.A.E. 30, as shown at the end of run four.

During run five viscosity was tested without drainage at three points. The

run was started with S.A.E. 30 oil in the crankcase and the carburetor adjustments and spark plugs as in test run four. The last oil used was of low quality, judging from the price, and the oil was not changed but new oil was added as needed from time to time. The length of test run five is 4250 miles. The first test of viscosity showed a decided drop, indicating dilution, and from this point on there was a steady increase in viscosity until it reached more than 40 when it was drained out. The change in viscosity in this oil during this run is explained as follows: Gasoline passing by the rings caused dilution and lowering of viscosity for the first 1000 miles. During this time evaporation of the light oil, included in the crankcase oil, was exceeded by the gasoline coming down from the cylinders. The light oil ends continued to evaporate, and as new oil was added the remaining oil in the crankcase became of higher and higher viscosity. A point was reached where normal dilution did not maintain the low viscosity and this was partly due to the fact that the decreased lubrication value of the very heavy oil caused an increase of engine temperature.

Coordination of Transport Services As It Stands Today

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Fourth: The interchange of freight among railroads by motor trucks used in lieu of railroad freight cars, in order to take advantage of the smaller motor vehicular units, to reduce transfer time, and to eliminate round-about railroad terminal interchange movements.

Fifth: The use of motor trucks in place of railroad equipment in distributing shipments from main freight stations to outlying freight stations of the same railroad, and in concentrating shipments delivered at the outlying stations at principal carload freight houses so as to make possible the heavier and motor direct loading of freight cars.

Sixth: Substitution of motor truck for railroad service in connection with movements of freight between points in the same terminal area, so as to keep intra-terminal freight movements out of the congested terminal areas entirely.

Seventh: The connection of railroads and steamship lines by motor trucks in lieu of railroad switching services.

Eighth: The substitution of motor trucks for railroad freight cars and switching service to connect steamship piers with industrial sidings of shippers and consignees.

Ninth: Organized cartage service, including store-door pick-up and delivery services.

Coordination is not a panacea for all ills of transportation, but it is a means of conserving the best interests of carriers and shippers. Progress is being made in coordination, but the ultimate achievement of a comprehensive system of coordination depends upon the more complete understanding of the true costs of transportation of each type of carrier, a fair and equitable system of local, state and federal taxation, and a constructive and comprehensive system of regulation of all types of carriers, so as to give each type of carrier the fullest opportunity to fill the role on the stage of transportation for which it is economically best fitted.